

DOCUMENT RESUME

ED 433 202

SE 062 283

TITLE 4-H Horticulture Project Activity Guides. Leader's Guide and Units 1-3.
INSTITUTION Illinois Univ., Urbana. Cooperative Extension Service.
REPORT NO 4-H-MJ0601; 4-H-MJ0605; 4-H-MJ0610; 4-H-LJ0601
PUB DATE 1996-09-00
NOTE 160p.
PUB TYPE Guides - Classroom - Learner (051) -- Guides - Classroom - Teacher (052)
EDRS PRICE MF01/PC07 Plus Postage.
DESCRIPTORS Agriculture; *Botany; *Earth Science; Ecology; Elementary Secondary Education; Environmental Education; *Hands on Science; *Horticulture; Integrated Activities; Leadership Training
IDENTIFIERS Gardening; Gardens; *4 H Programs

ABSTRACT

This document, concerning the 4-H horticulture project, includes a leader's guide and three youth activity guides. The leader's guide can be used to plan group project meetings that are both fun and educational. Activities can be adapted to various age groups. The leader's guide includes basic information for growing plants indoors and outdoors, answers to some of the activities in the three youth activity guides, and a list of valuable resources to help guide youth in their horticulture project experience. The three youth activity guides are designed to give young people a wide variety of horticultural experiences. They emphasize life skills rather than specific horticultural information. Different sections in each book focus on a particular life skill and provide activities that allow youth to practice that skill. Examples of life skills encouraged by the activities are: learning to learn; planning and organizing; making decisions; and communicating with others. Unit 1, "Budding Gardeners," covers growing edible sprouts and vegetables, planting flowers, pollination, garden design, and flower arrangement. Unit 2, "Branching Out," includes activities on hydroponics, air layering, transplanting, controlling pests, testing soil, and using mulches. Unit 3, "Digging Deeper," gives opportunities to develop leadership skills, organizational abilities, and presentation skills through such activities as conducting a gardening workshop, instructing younger members, arranging a tour, producing a video, giving a public presentation, or hosting a debate. (CCM)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *



Leader's Guide

PERMISSION TO REPRODUCE AND
DISSEMINATE THIS MATERIAL HAS
BEEN GRANTED BY

L.A. Rund

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)

1



U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

This document has been reproduced as
received from the person or organization
originating it.

☐ Minor changes have been made to
improve reproduction quality.

* Points of view or opinions stated in this
document do not necessarily represent
official OERI position or policy.

Horticulture Project Activity Guide for Group Leaders

Name _____ County _____

Contents

Your Horticulture Leader's Guide	3
Working with Young People	4
Experiential Learning	5
Life Skills: The Key to Success	6

Group Greatness

Learning to Learn

Plant Bingo	8
Word Games	10
Scavenger Hunt	12
Invent-a-Plant	13

Planning and Organizing

Plant-a-Thon	14
--------------------	----

Making Decisions

Name That Plant	16
What's the Difference?	17

Communicating With Others

Speak Up for Horticulture	18
Buy Now	20

Leader Support

Botany Basics	22
Indoor Gardening	26
Indoor Plant Chart	28
Vegetable Planting Guide	29
Outdoor Gardening	30
Answer Key for Youth Activity Guides	32
Resources	34

Your Horticulture Leader's Guide

The Horticulture Leader's Guide

Welcome to the 4-H horticulture project.

This leader's guide supports the three youth activity guides in the horticulture project.

- Adults and teens working with youth can use this guide to plan group project meetings that are both fun and educational. The guide includes group activities that can be adapted to various age groups. It includes basic information for growing plants indoors and outdoors. You'll also find answers to some of the activities in the youth project guides, along with a list of valuable resources that you can use to help guide youth in their horticulture project experience.

Horticulture Youth Activity Guides

The 4-H horticulture series includes three activity guides for youth. These guides are designed to give young people a wide variety of horticulture experiences—from flowers, to herbs, to vegetables to house plants and flower arranging. Youth can work at the level most appropriate for them, whether beginning, intermediate or advanced. Each book builds upon the knowledge and skills gained in earlier project work.

These activity guides emphasize life skills, rather than specific horticulture information. Different sections in each book focus on a particular life skill and provide activities that allow youth to practice that particular skill. This approach gives young people practical experience in developing leadership qualities, communication skills, organizational abilities, and decision-making skills. Most of the activities in these guides are suited to both group and individual learning situations.

Each activity guide also includes an achievement program to encourage youth to learn more about horticulture and to recognize youth for their accomplishments in the project. Your support is vital in helping youth complete the achievement programs.

Your Role

Whether you work with young people in a classroom, camp, 4-H club, or another youth group, you have an important role in helping them succeed in the 4-H horticulture project.

Your main role is to provide a safe, supportive environment for youth to practice important life skills. The 4-H group is where many youth get their first experience in delivering a speech or planning an event. Positive experiences in a 4-H group give young people confidence as they strive to meet new challenges in their daily life. Your guidance and encouragement will go a long way in helping youth develop the skills they need in order to succeed.



Acknowledgements

Curriculum Coordinator:

Ann Rund

Extension Specialist, Youth Development

Content Specialist:

Jim Schmidt

Extension Specialist, Horticulture

Writer/Designer:

Annette Campbell

Extension Educator, Communications

Editor:

Phyllis Picklesimer

Artist:

Jerry Barrett

Working with Young People

As a volunteer working with youth, you will want to tailor your horticulture activities to the needs of youth at different ages and levels of maturity. In general, young people at certain ages have identifiable characteristics. An understanding of these general characteristics will go a long way toward helping youth get the most from their 4-H horticulture project.



Youth Ages 9 to 11

Young people at this age like active physical learning. They especially like working in groups. They are easily motivated and eager to try new things. Their interests often change rapidly, jumping from one thing to another. They are extremely curious, always asking *Why?*

These young people also have a strong desire to succeed and are sensitive to criticism. They want to feel accepted and worthwhile. They need positive encouragement and recognition for doing good work. Emphasize the success

of each individual. Your role as the project leader is crucial at this stage. These youth often look to adults or older peers for approval and guidance.

Plan a wide variety of group activities that involve concrete concepts. These activities should take a short amount of time to complete and should encourage hands-on learning. They should foster cooperation and teamwork rather than competition. Do not answer all of the questions that youth ask. Encourage them to find some answers on their own and then report to the group.

Youth Ages 12 to 14

Youth at this age are often concerned about their physical development and being liked by friends. Growth spurts occur at different ages, with girls usually maturing before boys. Some youth may be self-conscious about the physical changes in their bodies, while others are concerned about the lack of changes they are experiencing. This stage of development presents the biggest challenge to a young person's self concept.

Youth at this age still like fun, active learning but are ready for more in-depth experiences. They can grasp abstract concepts and they like to find their own solutions to problems. They also like working with teens or adults whom they admire. They seek independence yet want and need their parents' help.

Your strategy for this age group is to provide a supportive environment for testing new ideas and skills. Encourage learning activities that help youth understand themselves and others. Assist youth in developing individual skills. Provide hands-on, skill-based experiences that relate to the project. Team up these young people with well-liked teen or adult helpers. Provide supervision and assistance, but avoid interference.

Youth in this age group need to feel accepted and valued. Take great care not to embarrass them and continue to avoid comparing young people with each other.

Youth Ages 15 to 18

By this age, most teens have specific interests. They are likely to be more interested in their friends than parents, teachers or other adults. They usually like dating and social interaction, and they want to be accepted by members of the opposite sex. These teens begin to think about adulthood and their future. Their goals for college, employment or marriage influence the activities they choose. Teens at this age also want leadership roles. They want to plan and carry out their own learning experiences.

Give teens opportunities to plan and carry out group activities. Give them the job of helping younger members with specific tasks. Become a coach or mentor for teens, and encourage independence and responsibility.

Also provide plenty of opportunities for career exploration. Help them match their personal interests and skills to potential careers. Guide and support them as they strive to make plans for their future.

Experiential Learning

Just as its name implies, experiential learning means that youth learn through experience. In many learning situations, this active approach is more effective than traditional teaching methods. 4-H has a long history of hands-on learning. This is what distinguishes 4-H from traditional education. When experiential learning is used, youth practice new concepts and use reasoning skills to process what they learn. This learner-centered method enables youth to learn, remember, and apply new skills and knowledge.

As you can see from the diagram of the *Experiential Learning Model*, youth start by doing an activity on their own. Then with your guidance, youth reflect on what they did and how they can apply the learning to other situations. As a 4-H volunteer, your goal is to provide the setting for experiential learning to occur. This often means sitting back and watching, letting youth discover answers for themselves. Avoid the temptation to do the work for youth. This can make youth feel incapable. Instead, take on the role of mentor or coach, providing support and guidance only as needed.

Experiential Learning Process



Life Skills: The Key to Success

4-H projects are designed to help youth develop important life skills. These life skills enable young people to:

- recognize and respond to significant life events
- participate in an interdependent society
- lead a productive, satisfying life
- contribute to society
- function in a changing world

The 4-H horticulture activity guides use indoor and outdoor gardening experiences to help youth practice and develop life skills. The life skills emphasized in this series are:

- Learning to Learn
- Communicating with Others
- Making Decisions
- Planning and Organizing
- Leading Self and Others
- Planning Your Life



Learning to Learn

Importance of the life skill: Youth who have learned how to learn exhibit inquiring minds and intellectual curiosity. They have the ability to ask informed questions, identify and locate resources, think critically, utilize all their senses, understand their best learning styles, and predict likely outcomes of situations.

Ideas for developing the life skill: Give youth experiences in finding resources, gathering information, developing plans, forming questions, conducting experiments, and creating alternative explanations.



Leading Self and Others

Importance of the life skill: Youth who have developed leadership qualities are able to build teams, plan, organize and implement activities, set goals, and help others achieve success. They learn how to work efficiently, plan their time, meet deadlines, communicate effectively, and relate well to others.

Ideas for developing the life skill: Give young people leadership responsibilities. Let them plan and conduct individual and group activities. Let youth conduct their own group meetings, plan and implement workshops or clinics, teach others, and take responsibility for specific programs or events.

Life Skills: The Key to Success

Planning and Organizing

Importance of the life skill: Youth who can plan and organize are able to set goals, build teamwork with others, assign tasks, work efficiently without supervision, meet deadlines, and show self confidence.

Ideas for developing the life skill: Give youth opportunities to plan and organize individual and group activities. Let youth plan a tour, organize a gardening clinic, implement a skill-a-thon, or manage a community project.



Communicating with Others

Importance of the life skill: Youth who have learned effective communication skills are able to exchange ideas and information clearly, minimizing the chances of confusion or misinterpretation. Their personal relationships benefit as they learn how to share their feelings, resolve conflict, and give and receive support.

Ideas for developing the life skill: Provide a variety of communication experiences for youth. Encourage both public and personal communication. Encourage youth to communicate through speech, print, art, music and drama. Interviewing others, delivering public presentations, writing plans and ideas, and drawing observations are only a few of the many ways to encourage communication skills.

Making Decisions

Importance of the life skill: Youth who have learned effective decision-making skills have the ability to make informed decisions. They have learned how their own personal values influence the decisions that they make. They have learned how to evaluate different options and make an informed decision.

Ideas for developing the life skill: Give youth experiences that require making decisions. Activities such as judging, presenting oral reasons, debating, comparing and selecting alternatives, and making group decisions help youth develop the confidence and skills they need.

Planning Your Life

Importance of the life skill: Youth with this skill have clear goals about their future. They explore their career options and gather information to make informed decisions. They have confidence about where they are going and how they will get there. This sense of purpose helps them critically evaluate their activities and decisions.

Ideas for developing the life skill: Provide young people with opportunities to define their career goals. Give them practical experiences that will help them evaluate possible career choices. Interviews, tours, information-gathering, job shadowing, and internship programs are but a few of the possibilities to help youth get excited about their future.

Group Greatness

Fun and excitement are important components of working with youth groups. Whether you teach in a classroom, lead a 4-H group, work in a camp setting, or volunteer your time to a youth horticulture club, you will want to get youth excited about learning. Horticulture project meetings are an excellent setting for

helping young people learn about horticulture and develop important life skills. You can use these group activities to add fun and liveliness to your project meetings. And since each activity follows the experiential learning model, youth will be learning a lot more than horticulture facts—they'll be learning skills for life!

Plant Bingo

Here's a new twist on an old favorite. This game will help youth remember horticulture terms and their meanings. Just like in traditional bingo, the object of this game is to get five horticulture terms in a row—across, down, or diagonally. Youth are involved from the very beginning of the activity as they make their own bingo cards and select bingo categories. The first person to *bingo* wins the game.

Life Skill:

Learning to learn

Project Skill:

Learning horticulture terms

Activity:

Make hort bingo cards and play game

Time Involved:

30 minutes plus card preparation time

Materials Needed:

Blank sheet of paper and pencil for each player, horticulture resources, beans, rulers

Do the Activity

Give each person a piece of paper and pencil and set out some rulers and horticulture resources for the group to share. Ask each person to make five vertical columns and six horizontal rows, just like a bingo card. Put each letter in the word PLANT in the top squares. Next, ask the group to choose five horticulture categories. Examples might be garden tools, plant parts, compost materials, flower parts, or vegetable names. After the group chooses the five categories for the game, have the youth fill the five spaces of each column with appropriate words for that category. For example, under the category PLANT PARTS one person might fill in stem, seed, root, flower, and leaf. Another person might have five different parts listed.

When each person has filled in all 25 spaces, the game is ready to begin. Start by asking one person to say a word from any column and tell something about the word. A player might say: "plant needs category, light—it is needed for photosynthesis." All players who have the same word (that is, light) place a bean on it. The next player says a second word from any column and repeats the process. Play continues until one person has bingo: five words in a horizontal, vertical, or diagonal row.

P	L	A	N	T
Veggies	Tools	Flower Parts	Compost Materials	Plant Parts
carrots	hoe	stigma	straw	stem
corn	spade	petal	leaves	leaf
pepper	shovel	stamen	manure	root
potato	rake	ovary	egg shells	seed
squash	trowel	style	nut shells	flower



Talk It Over

Ask What Happened

What new terms did you learn from the plant bingo game?

Why is it important to understand different horticulture terms?

Why is it important to be able to put terms into groups or classes?

Process What's Important

What made this a fun way to learn new horticulture terms?

What did you like best about this kind of learning?

Make the Connection

How do games help you learn new things?

Apply the Learning

What other things could you learn about by playing games?

Sample Bingo Categories

Mulches
Plant pests
Plant needs
Herb names
Flower names
Plant diseases
Propagation terms
House plant names
Vegetable varieties

Take a Challenge

1. Organize a committee to design a new game that will help members learn something about horticulture.

Word Games

Just as any other area of learning, horticulture has its own unique vocabulary. Young people who are interested in horticulture need a basic understanding of the vocabulary used in the field in order to explore new concepts. Word games are a good way to help youth learn new words and their meanings. Try some of the games described here and see just how much fun learning can be.

Life Skill:

Learning to learn

Project Skill:

Learning horticulture vocabulary

Activity:

Play horticulture word games

Time Involved:

Varies with game; 15-45 minutes

What You Need:

Paper, pencils, glossaries from the horticulture activity guides, specific materials for each game

Lay the Groundwork

Ask a couple of youth to review the word games on the next page and select one or more to play. Explain that they should prepare any needed materials and be ready to explain the game to the group.

Do the Activity

Have the youth leaders implement the activity for the group. End games while enthusiasm is high. Remember, it's better to have them wanting more than to get bored from letting a game run too long. After the games have ended, discuss the questions in the *Talk It Over* section to help youth process what they learned and how they learned.

Take a Challenge

1. Divide the group into pairs. Have each pair make up a new word game. Use these new games at future meetings.
2. Have the group make a new board game or change an existing board game to learn new horticulture information.

Talk It Over

Ask What Happened

What new words did you learn?

Which game helped you learn best?

How did you feel about learning this way?

Process What's Important

How do games help you learn and remember new information?

What other games have you played to learn new information?

Make the Connection

Why is it important to know how you best learn new things?

Apply the Learning

What other kinds of games could you use to help you learn and remember new things?

Spelling Bee

Materials needed: index cards with a horticulture term on one side and its definition on the other side.

Divide groups into teams of two or three players. Designate one of the youth to be the game leader. The game leader draws a word card and reads the word to the first team. That team tries to spell the word correctly. If the spelling is incorrect, the second team tries to spell the word. Alternate between teams until the word is spelled correctly or the game leader gives the correct spelling. The game leader allows each team three tries before giving the spelling.

Definition Bee

Play the same as Spelling Bee, but ask for a definition instead of a spelling of the word.

Word Clue

Play the same as Spelling Bee, but give only the definition of the word. Teams must correctly identify the word.

Word Scramble

Materials needed: large sheet of paper with scrambled horticulture words—one sheet per team; dark marker or pen for each team; horticulture activity guides.

Divide group into teams of three to five players. Give each team a sheet of paper and a marker. Put the horticulture activity guides in a central place where each team can use them. Have each team write ten scrambled horticulture terms on the paper. Then, each team exchanges their scrambled list with another team. At the leader's signal, teams work together to unscramble their new word list. Complete the game by having each team tell the meanings of their unscrambled words.



What Am I?

Materials needed: horticulture terms printed on pieces of paper or index cards—one per player; safety pins.

Start by having all players stand in a line with their back to you. Pin a horticulture term to the back of each player's shirt. Have players ask each other yes or no questions that will help them figure out what they are. Samples of questions might be: *Am I living or dead? Am I a plant part? Am I a garden tool? Do I grow in the winter?* Play continues until all youth have figured out their terms. Complete the activity by having each player tell their horticulture term and its meaning.

Definition Hunt

Materials needed: slips of paper with horticulture terms—two or more per player; slips of paper with a definition of each term; bag or bowl; masking tape.

This game is best played in a large room or outdoors. Before players arrive, hide definition papers by taping them to objects (under chairs, on buildings, on plant stems, etc.). Fold the horticulture term slips and put them in a bag or bowl. When play is ready to begin, each youth pulls two terms from the bag. Upon a signal from the leader, players then look around the room or grounds for the definitions that match their terms. When players find a definition that does not match their words, the definition is left hidden for others to find. As players find correct definitions, they present their words and definitions to the group leader for confirmation. Players who correctly match their words/definitions early in the game may help other players until all definitions are located.

Charades

Materials needed: horticulture word cards for each player; choose words from the glossaries that can be acted out by youth.

The game leader gives each player a word card. Allow 5 to 10 minutes for youth to plan how they will act out their words. Young players may need extra help. When play begins, the game leader asks for volunteers to act out their word while others try to guess the word.

Scavenger Hunt

Scavenger hunts appeal to youth of all ages. With a little planning, a scavenger hunt is an ideal way to help youth learn to identify lots of different horticulture items. The game also encourages teamwork among youth. In a horticulture scavenger hunt, two or more groups of players are given a list of items to find and a certain amount of time to gather the items on the list. The winner is the group that finds the most items in the shortest time.

Life Skill:

Learning to learn

Project Skill:

Identifying horticulture items

Activity:

Play scavenger hunt game

Time Involved:

45 minutes

What You Need:

Hunt list, pencil, bag or container for each group

Lay the Groundwork

Make a list of ten or more horticulture items. Copy the *hunt list* for each team that will play. Include items that involve identification of plants or plant parts. For example, ask for a maple tree leaf rather than just a leaf. The time of year may limit the items you can include on your list.

Do the Activity

Start the activity by dividing the group into teams of three or four players. Give each team a hunt list, a bag, and a pencil to check off found items. Explain that they will have 50 minutes to find the items on their list. Stress the value of working as a team to find the items. Explain the boundaries of the game, whether it is a backyard, a certain area in a park, or a neighborhood. Indicate how you will let the players know when time is up. Also, tell how the winner will be determined.

Sample Items for Hunt List

Philodendron leaf	Bean seeds
Seed container	Bulb
Marigold seeds	Pine needle
Corn tassel	Branch from a yew
Perennial flower	Oak tree leaf
Annual flower	Lettuce leaf
Plant that can be	Broccoli flower
propagated by division	Parsley

Talk It Over

Ask What Happened

What part of the activity was the most fun?

How did you find the items on the list?

What did you learn about your ability to identify different horticulture items?

Which items were hard or impossible to find?

Process What's Important

Why is it helpful to work as a team when you are completing a task?

What other team experiences have you had?

Make the Connection

What did you learn about your ability to work with others on a team?

Apply the Learning

What other things would you learn best from a team or group activity?

Invent-a-Plant

Sometimes young people can learn the most about their own abilities and knowledge by letting their imaginations run wild. In this activity, youth will invent a plant for a specific purpose. Youngsters will enjoy creating imaginative plants, such as a plant that grows money or a plant that washes dishes. Challenge older youth by having them design a more realistic super-plant, such as a plant that supplies all of the nutrients needed for a day or a plant that is pest-resistant.

Life Skill:

Learning to learn

Project Skill:

Creating new plants

Activity:

Design an imaginary plant

Time Involved:

30-45 minutes

What You Need:

Paper, pencils, crayons or markers

Do the Activity

Ask youth to work individually or in groups to invent a plant that has a specific purpose. Their invented plants can be based on their knowledge about plants or their own creative vision of a useful plant.

Provide youth with paper and pencils, crayons, or markers. Ask them to draw or write a description of their invented plants.

When everyone has completed their inventions, ask individuals or teams to present their plant to the group and explain whether or not their plant could be produced in reality.



Take a Challenge

1. Have youth research how new plants are developed using biotechnology.

Talk It Over

Ask What Happened

What would your plant do?

Why did you invent this plant?

Do you think this plant could really be grown?
Why or why not?

What did you learn from this activity?

Process What's Important

Why do scientists need creative skills in addition to their scientific knowledge?

Make the Connection

What did you learn about your own creativity?

Apply the Learning

How can you use your creative skills in future learning situations?

Plant-a-Thon

Here's an activity that will get everyone in your group involved in learning about plants. In small teams, youth perform different tasks related to horticulture at a series of stations. Teams try the task before being shown or told how to do it. A station leader then helps youth process what they have learned by asking them questions about the experience. This kind of hands-on learning is what makes 4-H different from other kinds of education. While your group members are having fun planning and conducting the Plant-a-Thon, they will also be learning more about horticulture and developing their leadership and organizational skills.

Life Skill:

Planning and organizing

Project Skill:

Developing horticulture skills

Activity:

Plan and conduct a Plant-a-Thon

Time Involved:

90 minutes

What You Need:

Youth leaders to conduct stations, station signs, materials for implementing each station

Lay the Groundwork

Select a committee of older youth to organize the Plant-a-Thon. Start the planning process several weeks before the event. Help the committee think about the jobs, materials, and people needed to conduct the activity. Also, develop some questions that station leaders can use to help youth process their learning. Use the planning outline and station ideas to help guide the committee. When plans are set, publicize the event to group members.

Do the Activity

Before group members arrive, have station leaders set up their station tasks, signs, and supplies. Start the activity by dividing the group into teams of three or four. Assign each team to a starting station and explain that they will have about 10 minutes to complete the task before moving to the next station.

When the event is over, meet with the committee to evaluate the activity, make plans for returning supplies, and clean up the room.

Plant-a-Thon Planning Guide

Station # _____

• Topic: _____

• Task to Complete: _____

• Supplies Needed: _____

• Follow-up Questions: _____

• Person in Charge: _____

Talk It Over

Ask What Happened

What part of the Plant-a-Thon was the most fun? What was the most challenging part?

How did you feel about your role in planning or conducting the activity?

Process What's Important

What did you learn from this activity?

Which stations worked the best? Why?

Why is planning important in conducting a group activity?

Make the Connection

How is this kind of learning different from your school learning?

What other times have you participated in a learning activity like this?

Apply the Learning

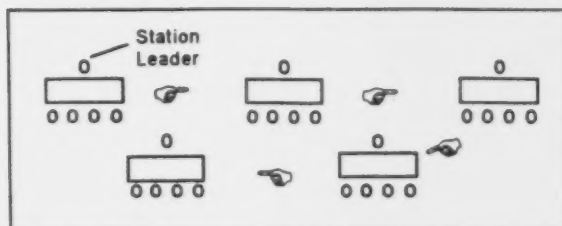
What did you learn about your planning skills and ability to lead a group?

What will you do differently the next time you organize a group activity?



Setting Up Stations

Mark each station with a sign that includes station number, name, and task. Make sure all supplies needed to complete the task are at the station. Include examples or pictures of difficult tasks.



Station Ideas

- Identify different garden vegetables.
- Demonstrate stem propagation.
- Identify compost ingredients.
- Identify elements of good and poor landscaping and give oral reasons.
- Judge different flower arrangements.
- Classify flowers as annuals or perennials.
- Identify different herbs.
- Demonstrate division propagation.
- Identify different garden pests.
- Demonstrate transplanting a seedling.
- Make a label showing information that would be included on a soil sample.

Take a Challenge

1. Conduct your Plant-a-Thon for another group.

Name That Plant

Here's a chance for your group to put plant knowledge to work. Through their own experiences, youth have probably learned what plants grow best at their home. This activity takes that knowledge a step further as youth select plants that they think will thrive under a variety of growing conditions. Using a TV game-show format, your group will learn about plants, practice decision making, and have lots of fun.

Life Skill:

Making decisions

Project Skill:

Selecting plants

Activity:

Participate in plant game show

Time Involved:

30 minutes

What You Need:

Gardening scenario cards, clock or watch with second hand, gardening resources, paper, pencil

Lay the Groundwork

Involve older youth in creating descriptions of different gardening scenarios. On index cards, write descriptions for 15 or 20 imaginary situations.

Sample Gardening Scenarios

- TJ lives in an apartment and wants to grow flowers on the shaded patio. Name a flower that will grow under these conditions.
- Chris wants to grow a vegetable plant in a sunny kitchen. What vegetable might grow?
- Theo wants to add perennials to his flower bed. Name three perennial plants.

Do the Activity

Divide your group into teams of four or five. Have each team sit together in some part of the room, such as a team in each corner. Ask for volunteers to serve as the game host, time-keeper, scorekeeper, and judges. Gardening resources, such as flower gardening books, horticulture activity books, and vegetable guides, are given to the judges. The host

reads one of the scenarios about a gardening situation. The first team to respond with an acceptable answer gets a point. Set a time limit, such as 1 or 2 minutes, for responding to each question. If a question is not answered, the host goes on to the next scenario. Judges decide if answers are correct. Play continues until all scenarios are used.

Talk It Over

Ask What Happened

What did you learn from this activity?

Why is it important to consider specific growing conditions when selecting plants?

Process What's Important

When team members disagreed about a response, how did you make your choice?

Make the Connection

Why is decision making sometimes harder in a group of people?

Apply the Learning

In future group situations, what methods can you use to help people make decisions?

What's the Difference?

Learning how to deliver public presentations is an important part of the 4-H program. A vital first step in presentation planning is knowing the difference between various kinds of presentations. For example, youth may get confused about the difference between a demonstration and an illustrated talk. This activity will help clear up those confusions and get youth excited about public presentations.

Life Skill:

Making decisions

Project Skill:

Identifying different types of public presentations

Activity:

Categorize public presentations

Time Involved:

30 minutes

What You Need:

Paper, pencils, model presenters

Lay the Groundwork

Before the group meets, ask three to five experienced youth to prepare one of these public presentations: formal speech, illustrated speech, demonstration. Have at least one of each type of presentation.

Do the Activity

Give an overview about the basic differences between a formal speech, illustrated speech, and demonstration. Follow this brief overview with the sample presentations by the youth. After each presentation, have youth discuss its characteristics and decide whether it is a speech, illustrated speech, or demonstration.

Characteristics of Presentations

Formal Speech:

- telling through speech
- no visuals used

Illustrated Speech

- telling through speech
- visuals used to support points

Demonstration:

- telling through speech
- showing with actions
- support visuals may/may not be used

Talk It Over

Ask What Happened

What are three main types of presentations?

What are the characteristics of each?

Process What's Important

Why is it important to consider the topic when deciding what kind of presentation to do?

Make the Connection

What kind of presentation helps you learn best? Why does this type work better for you than other types of presentations?

Apply the Learning

How will knowing about characteristics of different kinds of presentations help you decide on future presentation strategies?

Speak Up for Horticulture

For years, 4-H has been known for helping young people develop presentation and speaking skills. These skills are important for success in life. Making a young person's first public presentation a fun experience can spark enthusiasm that will last for years. This activity gets your entire group involved in developing public speaking skills.

Life Skill:

Communicating with others

Project Skill:

Giving horticulture talks

Activity:

Prepare and deliver a horticulture talk

Time Involved:

50-60 minutes

What You Need:

Paper, pencils, horticulture props, posterboards, markers

Lay the Groundwork

Put several horticulture-related props, such as a trowel, packet of seeds, pots, mulch, or pictures of landscapes, in a large box. Ask an older youth to prepare a 5-minute overview of how an illustrated talk is organized. Ask another youth to prepare a sample 3-minute illustrated talk on a horticulture topic.

Do the Activity

Have the youth leaders give the brief overview and sample talk. Then, pair each youth with an adult or older group member. Have youth pick a prop from the box. Explain that they will use the prop as they work with their adult or older youth partners to put together an illustrated horticulture speech. Give youth 15 to 20 minutes to develop their presentations. Encourage them to use the posters to outline main points of their presentation.

After the planning, ask for a volunteer to be the first presenter or pick a name from a hat. The first presenter then draws the next name. Praise each presenter and use the *Talk It Over* questions to process the experience.

Teaching Outline: Illustrated Talks

I. Review the characteristics of an illustrated talk. Give examples and nonexamples of illustrated talks. Stress the difference between an illustrated talk and a demonstration.

II. Explain the A-B-C method of putting together a presentation:

Attention-Getter

- gets the audience interested in learning more about your topic
- introduces the topic

Body

- three to five major points that support the presentation
- props, posters, or other visuals are often used to make points

Conclusion

- summarizes the main points

III. Follow this overview with the sample illustrated talk given by an older youth.

Talk It Over

Ask What Happened

How did you feel as you delivered your talk?

What was the best part about giving an illustrated talk? What were the challenges?

How did you organize your presentation?

Process What's Important

What did you learn about delivering speeches by watching others?

What makes a good illustrated talk?

How is an illustrated talk different than a demonstration or formal speech?

Make the Connection

How do television commercials use illustrated talks to persuade you to do something?

How do you communicate with props in your daily activities?

Apply the Learning

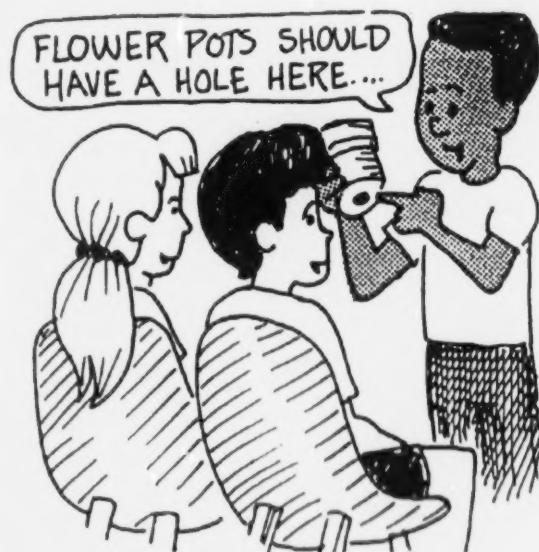
How will public speaking skills help you at school? at home? in a job?

How can you become a better communicator?

My Hort Talk	
Title:	_____
Attention-Getter:	_____

Body:	_____

Conclusion:	_____



Take a Challenge

1. Help your group develop a public presentations workshop that can be taught to other groups. Older youth can take teaching roles, and younger members can give short presentations as examples.
2. As a group, attend a local public presentations contest. Discuss youths' observations following the contest.

Buy Now

Learning takes center stage in this activity as youth produce their own advertisement for a gardening product. Whether it's for television, radio, or print, producing an ad is a great way to learn more about plant products.

Youth will also develop their communication skills and self confidence as they move into the spotlight for their advertising debut.

Life Skill:

Communicating with others

Project Skill:

Learning about horticulture products

Activity:

Produce an advertisement

Time Involved:

30-45 minutes

What You Need:

Paper, pencils, markers, props, tape recorder or video camera (optional), poster or large sheet of paper

Lay the Groundwork

Before the group meets, gather various indoor and outdoor gardening items that can be used as props. Examples include seed packets, hoe, trowel, plastic mulch, plant food, or plant containers. Copy the ad outline on the next page onto a poster or large sheet of paper. Post this outline in the room to help guide youth in the planning process.



Do the Activity

Explain that the task is to plan and produce an advertisement to promote a product related to horticulture. The ad can be for television, radio, or print. Then, brainstorm ideas for ads with your group. Possible ideas might be bulbs, certain vegetable varieties, mulches, garden tools, house plant food, or flower pots. Next, divide the group into pairs or small teams. Allow each team 20 minutes to plan their ad. Draw their attention to the ad outline posted in the room.

For radio or television ads, encourage youth to use any delivery method they wish, such as song, simple talk, lip synch, rap, interview, etc. After the planning time, have each team present their advertisement to the group. Following each presentation, ask the team questions about how they came up with the idea and what they learned from planning and presenting their advertisement. After all the teams have made their presentations, use the *Talk It Over* questions to help youth process what they learned.

Ad Outline

Product _____

Target Audience _____

Selling Message _____

Medium to Use
(TV commercial, radio spot, newspaper ad)

Materials Needed to Produce the Ad

Promoting Hort Products

Advertisements are generally produced to get people to buy a product. Advertising producers decide what specific audience is likely to need or want the product. Then, they plan a commercial or ad to appeal to that particular audience. Horticulture products are promoted in various ways. A television commercial might be used to sell garden tillers. A radio advertisement might promote a local horticulture business. These commercials are usually 30 to 60 seconds in length. Infomercials, those longer 30-minute TV programs, are designed to show audiences how a product works and entice people to buy the product. Gardening catalogues, sales fliers and newspaper ads bring horticulture products right to the consumer's home.

Talk It Over

Ask What Happened

What did you learn from making your ad?

What was the most challenging part?

How did you feel about being in the spotlight as you presented your ad to the group?

Process What's Important

How were the ads different and alike?

What are the elements of a good sales ad?

How does the target audience affect how an advertisement is produced?

Make the Connection

How do advertisements try to persuade you to take some specific action?

How will you look at advertisements now that you know how they are made and what they are designed to do?

Apply the Learning

How can analyzing advertisements help you make better buying decisions?

Take a Challenge

1. As a group, plan and produce an advertising campaign for a new horticulture business. Your campaign could include TV spots, radio ads and direct mail pieces.

Leader Support

The 4-H horticulture series is designed to encourage youth to discover their own answers to questions. They are likely to use resources like books, other gardeners, and the Extension Service to find answers to their

questions. They may also ask you specific questions about plants. The information in this section will give you the background and resources needed to help youth in the 4-H horticulture project.

Botany Basics

Beginning with Seeds

Within every seed lives a tiny plant or embryo, complete with leaf, stem, and root parts. The seed coat protects the embryo while a temporary food supply nourishes it, either as an endosperm packed around the young plant or stored in special leaves called cotyledons. Every seed is either a monocot, having one cotyledon, or a dicot, having two cotyledons. Seeds remain inactive until conditions are right for them to grow, or germinate.

All seeds require oxygen, water, and the proper temperature range in order to germinate. Oxygen and moisture, initially taken in through the seed coat and later by the root, help the seed get energy from its food supply. Different types of seeds have specific temperature requirements and/or preferences for germination. Some seeds, such as tomatoes, require warmer temperatures—70 to 75°F., while others, such as lettuce, germinate better in cool temperatures—45 to 65°F.

Seeds have their own source of nutrients (in the cotyledons or endosperm) to sustain them through early life, so they do not require additional nutrients. The proteins, fats, and carbohydrates stored for the benefit of the young plant are what make the seeds such a rich and vital food source for humans and other animals.

When a seed is exposed to proper conditions for germination, water is taken in through the seed coat. The embryo's cells begin to divide and the seed coat breaks open. The root emerges first, followed by the shoot which contains the stem and leaves.

Our treatment of seeds during germination affects their chances of survival. If seeds are planted too deeply, the young plants can use up their food reserves before they ever reach the light and begin to make their own food. If planted in soil that's too dry, seeds may not obtain the necessary moisture to germinate. Soaking-wet soil, on the other hand, may prevent seeds from getting oxygen or may cause them to rot.

Because some seeds have very hard seed coats, they will germinate more quickly after being soaked or scarred to allow water to penetrate. This adaptation helps prevent them from germinating until there is adequate moisture for survival. For example, the seeds of many desert plants will grow only after exposure to large amounts of water.

Other seeds, like those of apples, require a period of chilling before they will germinate. This adaptation prevents some temperate-climate seeds from sprouting immediately after they drop from the plant in autumn and facing the winter as fragile seedlings.

Basic Plant Needs

Like all living things, green plants have basic needs. If light, water, air, nutrients, and an adequate temperature range are not available, plants cannot thrive and grow. Light energy is required for photosynthesis, in which plants make sugars in the leaves. Light also triggers flowering changes in certain plants.

Water is necessary to carry dissolved nutrients into the plant through the roots. It is one of the key ingredients in the process of photosynthesis and helps the plant release energy from stored food when needed. Water pressure in plant cells, which are 65 to 95 percent water, supports stems and leaves. Water transports nutrients, gases, and waste materials into, around, and out of the plant. It is an important component in the cells of all living things.

Plants require two of the components of air. They use carbon dioxide to make food during photosynthesis, and they use oxygen, as do humans and animals, to release the energy from that food during respiration.

Plants require mineral nutrients for growth, repair, and proper functioning. Mineral nutrients are formed by the breakdown of rocks and other materials in the earth. While humans obtain these minerals from plants, animals, or in the form of supplements, plants get these minerals from the soil (dissolved in water) or through fertilizers applied by humans. Although these minerals are important for health and maintenance, they cannot replace the sugar produced in the leaves, which can also be stored as carbohydrates, fats, and proteins.

Plant Roots and Stems

Roots play a vital role in enabling plants to meet their basic needs. They provide support, anchor the plant, and absorb necessary water and nutrients. Many roots are specialized to store sugars and other carbohydrates that the plant can use to carry out other functions.

As a seed germinates, the first part to emerge is the primary root. It anchors the plant and

begins to absorb water and minerals so the shoot can develop. From that point on, root development takes one of two directions, depending on the type of plant.

Some types of plants have a primary tap root with a few smaller, hairy branches. Reaching deep into the soil, these long, strong roots pull up nutrients and water from far below the surface. In some plants, tap roots expand and become storage sites for sugars and starches.

Other types of plants have a fibrous root system, a network of branching rootlets and root hairs appearing off the primary root. These networks can be extensive: a ryegrass plant, for example, can have more than 13 million branching roots covered with billions of root hairs. Fibrous roots are thus particularly good at holding onto soil particles. Beans, tomatoes, and grasses are examples of fibrous root systems.

In both tap roots and fibrous root systems, tiny root hairs are the bridges between the root and the water and dissolved nutrients in the soil. These root hairs provide a huge surface area for absorbing water and nutrients. If these root hairs are broken or damaged, a plant will have difficulty meeting its water and nutrient needs.

If a plant didn't have a transport system, all its parts would have to be close to the ground to have access to water and minerals in the soil. Plant stems provide this vital link between plant leaves and roots, enabling all plant cells to be within reach of water and nutrients. Stems are conduits through which water and minerals taken in by the roots can travel to the leaves and food produced in the leaves can travel to other parts of the plant.

Above-ground stems also provide support to the plant, allowing leaves to reach the light necessary for food production. Stems can respond to light by bending toward it, a phenomenon called phototropism. Below-ground stems typically serve as food storage sites.

Water and dissolved minerals actually move upward, against the force of gravity, through stems. This results from a combination of factors. Water moving into the roots pushes water upward into the stem. Water molecules cohere to one another, forcing the water column further upward, and they adhere to the sides of the conducting stems. In addition, transpiration, evaporation of water through leaf openings, actually pulls the water column upward. In some plants, water can be pulled up stems as fast as 30 inches per minute!

Leaves and Photosynthesis

Leaves are sophisticated chemical factories. Using nonliving raw materials in their environment, they convert energy from the sun to the energy green plants need to live.

Although leaves come in many different shapes and sizes, their general structure is well suited to the function of making food. For instance, most leaves, being relatively broad and flat, easily intercept light rays. The outer surface of most leaves contains many small pores, called stomata, which open and close. Carbon dioxide and oxygen enter and leave the plant through these pores. When open, stomata release excess water through a process known as transpiration. When closed, they limit water loss from the plant.

The cells on the surface of a leaf make up the epidermis, which protects the inside of the leaf. A waxy coating, the cuticle, waterproofs the leaf so that excess water does not enter. A network of veins carries water, nutrients, gases, and other materials to and from all parts of a leaf in order for food to be produced and energy to be used. Many leaves have a slender stalk, called a petiole, that attaches them to the stem.

Plants make their own food during the process of photosynthesis. Using light energy, green plants can convert water and carbon dioxide into the energy-rich simple sugar, glucose. This sugar is the source of food used by most plants and by those who eat the plants.

The ongoing process of photosynthesis takes place in two phases, each phase consisting of many complicated steps that are not yet fully understood. The first phase of photosynthesis requires light. Light rays strike the plant. Chlorophyll, a green pigment, traps the light energy. Water molecules, taken up by the roots and transported to the leaves, are split into hydrogen and oxygen using the captured light energy. Carbon dioxide is meanwhile taken in through the stomata.

The next phase does not require light energy. During this phase, the hydrogen that's been split from the water molecules combines with the carbon dioxide to form glucose. The oxygen left over from the water molecules is released into the atmosphere through the stomata, where it's used by humans and other animals. As the stomata release oxygen, they also let in more carbon dioxide so the process of photosynthesis can continue.

The plants use glucose for energy to perform various functions. Extra glucose is usually stored in the form of sugars and starches.

Flowers

The key agents in the process of seed production are flowers. Even though humans enjoy them for other reasons, the function of flowers is to produce seeds. Although flower structure can vary greatly, there are a number of basic parts. The female organ, the pistil, is generally in the center of the flower. The platform at the top of the pistil, often sticky to trap pollen, is the stigma. The stigma is held up by the tubelike style. The style leads down to the ovary, inside of which are the ovules, containing female egg cells. The male parts, the stamens, typically surround the pistils. The anther on top of the stamen, held up by the stem-like filament, produces pollen which contains male sperm cells.

Pollination is the transfer of pollen from male to female flower parts. When a grain of pollen lands on the stigma, a tiny tube grows from it and probes down the style into the ovary. Sperm cells then travel through this tube from the pollen grain to an ovule and there join with an egg cell in the process called fertilization. The fertilized ovule will become a seed, and the ovary will become a fruit. Without pollination and fertilization, fruit and seed production cannot occur.

Other important flower parts are the petals and sepals. Petals are often brightly colored to attract pollinators, and they are broad and flat to provide good "landing pads." Wind-pollinated flowers, on the other hand, usually have inconspicuous petals, if any. Sepals are green, leafy structures surrounding the petals, which initially protected the developing bud.

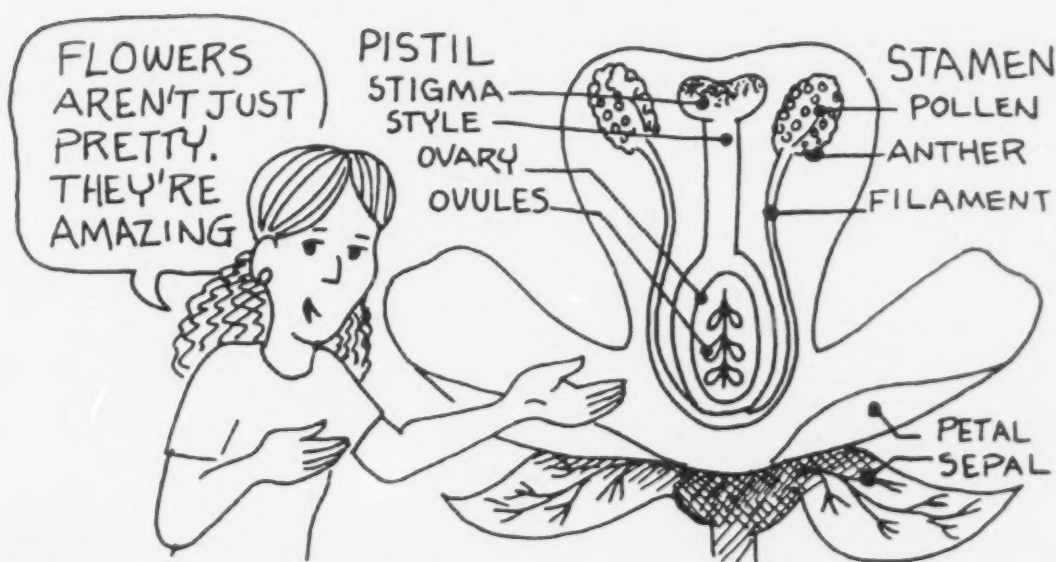
Perfect flowers have both pistils and stamens. Imperfect flowers are either male or female, and the pollen must somehow make its way from the male to the female flower.

Fruits

As ovules develop into seeds inside the ovary of a flower, the ovary swells and becomes fleshy or hardens to protect the developing seeds. The part of the plant containing the seeds is called the fruit. In addition to protecting the seeds, many fruits are designed to help seeds disperse.

Fruits actually take many forms, but they are categorized into two classes: fleshy and dry. Fleshy fruits have sweet, fleshy ovaries surrounding the seeds. They are enticing food for animals who, in turn, scatter seeds away from the parent plant.

The ovaries of dry fruits also contain the seeds, but the walls are thin and dry rather than fleshy. With some dry fruits, such as corn, wheat, oats, and barley, each fruit is a single dry layer covering one seed. Each grain on an ear of corn, therefore, is a fruit. Many nuts, on the other hand, have double walls enclosing a single seed. Still other dry fruits, like beans, peas, and milkweed, have a nonfleshy pod containing a number of seeds. When dry, the pods split open and let the seeds drop out. Some dry seeds have fluffy, feathery, or wing-like parts, which help the seeds float on the wind.



Indoor Gardening

Using Gardening Resources

One of the most important skills that young people can gain from a 4-H project is learning how to gather information from a variety of resources. House-plant activities offer many opportunities for independent learning and research. Youth will find many books and publications that provide very specific information on growing house plants. The reference list in this book includes books and materials that are specifically written for children.

This section provides very basic house-plant information that you can use to help guide youth. The growing chart of common indoor plants can also help youth in making decisions about what to grow. Encourage young people to find more information on growing specific plants that interest them.

Light

All plants need light but not the same amount and kind of light. Usually, plants grown for flowers require more light than plants grown for their leaves. Flowering house plants need more direct sunlight for longer periods of time than leafy plants do. House plants are usually divided into three groups according to the kind of light they need.

Direct sun plants need the brightest sunlight possible for several hours each day. Plants like geraniums and passion flowers do best when they are in full sunlight for many hours each day. Lack of sunlight results in small leaves, thin stems, and few flowers. These plants do best in south windows but will also do well in east or west windows that get plenty of direct sun.

Partial shade plants, like African violets, fuchsia, and gloxinia, like a few hours of direct sunlight each day, but they do best in bright shade. They are best kept in east or west windows.

Shade-loving plants are mostly leafy plants. They do best with very little direct sun and a lot of bright, sunless shade. They are best kept in north windows.

Water

Without water, plants will wither and die. Some will die faster than others, but all plants need water to live and grow. Overwatering, however, can be as damaging as underwatering. The best indicator that a plant needs to be watered is soil that is slightly dry to the touch. Very few plants need to be dried out completely between waterings.

Plants can be top watered, pouring water directly on the soil, or bottom watered, pouring water into a holding saucer. A good technique is to pour water directly on the soil until it comes out of the drainage hole, let the pot stand in the saucer for 30 minutes, and then pour out any water that remains in the container. For bottom watering, fill the saucer, wait 30 minutes and then pour out the water remaining in the saucer.

Plants prefer water at room temperature. Water that is too hot or too cold will shock plants.

Humidity

Another part of moisture is humidity. Many house plants are accustomed to living in areas where there is a lot more moisture in the air than in a home. Youth should find out the amount of humidity that a plant needs when it is purchased and avoid plants that need high humidity if the house tends to be dry. One way to provide humidity is to place plants in a pan that holds an inch of pebbles or sand. The pebbles or sand should be kept moist, but the water level should not get high enough to touch the bottom of the pots. Misting plants with water can also help.

Temperature

Most house plants will do well at the same temperatures preferred by humans. Some plants will not grow well at temperatures that are either too high or too low. It is important that these plants be kept at the temperatures they require if they are to do well.

Just about all house plants do best when the nighttime temperatures are 10 to 15 degrees lower than daytime temperatures. Plants put in a cooler room at night will be healthier and have better color. They should not be kept on drafty windowsills when nights are cold.

Soil

Most house plants grow well in a regular house plant mix (potting soil). Other plants do exceptionally well when variations are made. Only a few things are musts. The soil must drain well, hold some moisture and nutrients, and allow some air to get to the roots.

Garden shops, plant nurseries, and most variety stores sell a house-plant soil. These are excellent, clean, and easy to use. Youth can also make their own house-plant mix using the following combinations:

- Flowering plants—equal parts of potting soil, coarse sand, and peat moss
- Foliage plants—equal parts of potting soil and peat moss, small amount of coarse sand
- Cacti and similar plants—equal parts of potting soil and peat moss, double the amount of coarse sand

Fertilizer

Few house plants die from lack of food, but many die of indigestion. House plants should not be overfed; a lot is not better than a little.

Plants should be fed only during the time that they are really growing. When they are resting or only growing a little, usually in the winter when there is less light, leave them alone. The best and safest fertilizers to use on house plants are labeled organic and water soluble. The liquid or powder is dissolved in water and poured into the soil at the same time that the plant is watered. Remind youth to carefully read and follow the label instructions.

Containers

Plants can be grown in almost anything that will hold both soil and water. Garden shops have all kinds of pots. Clay, plastic, metal, and fiberboard containers are only a few of the options youth have. Plant containers can also be made from objects around the house.

Whatever kind of container is used, it needs to provide drainage. Drainage holes at the bottom of a pot require a saucer for water to run into when the plant is watered. If a container doesn't have a drainage hole, a layer of pebbles or gravel or broken clay-pot pieces should be placed in the bottom of the pot before dirt is added.

Plants are most comfortable in pots that suit their size. This means starting small plants in small pots and transplanting them as they get bigger and outgrow the pot. If roots are growing out of the drainage hole or are wrapped around the entire ball of dirt in the pot, then the plant is ready to be planted in a bigger pot.

Clay pots are porous. This means that air can pass through to the roots. The soil dries out faster in clay pots than in plastic pots, which are airtight. All pots should be clean, and clay pots can be soaked in water before use to keep them from absorbing water from the soil at first.



Indoor Plant Chart

Name	Light	Propagation	Water
Achimenes	indirect	separate tubers and repot	well in summer, less other times
African violet	indirect	leaf cuttings, division in spring	from below, keeping moist
Aluminum plant	indirect	tip cuttings early summer	well in summer, less in winter
Asparagus fern	indirect	division in spring	well in summer, less in winter
Cast iron plant	indirect	division in spring	moderate in summer, less in winter
Christmas cactus	indirect	cuttings in summer	well in winter, almost dry in summer
Coleus	direct	tip cuttings in spring or summer	well in summer, less in winter
Common ivy	shade	tip cuttings in autumn	moist all year
Cyclamen	indirect	corm or bulb	well in summer, barely in winter
Golden barrel cactus	direct	seeds in spring	moist in summer, dry October-March
Impatiens	direct	tip cuttings in summer, seeds	well in summer, moist in winter
Ivy-leaved geranium	direct	tip cuttings in summer	well in summer, almost dry in winter
Jade plant	direct	leaf cuttings in spring and summer	some in summer, dry other times
Kangaroo vine	indirect	stem tip cuttings in summer	well in summer, little in winter
Maidenhair fern	shade	division in spring	well in summer, less in winter
Philodendron	indirect	stem tip cuttings in summer	well in summer, less other times
Piggy-back plant	indirect	plantlets or division of parent	moist all year
Prayer plant	shade	division in spring	well in summer, little in winter
Rubber tree	shade	stem tip cuttings, air layering	well in summer, little in winter
Shrimp plant	direct	stem tip cuttings in spring	well in summer, little in winter
Spider plant	direct	plantlets any time	well February-September, little October-January
Swedish ivy	indirect	tip cuttings in autumn	moist all year
Wandering Jew	indirect	tip cuttings in spring	well in summer, little in winter
Weeping fig	indirect	cuttings in summer	well in summer, little in winter

Vegetable Planting Guide

Vegetable	Suitable For		
	Containers	Mini-garden	Full-sized Garden
Asparagus		x	x
Bean, snap		x	x
Beet		x	x
Broccoli		x	x
Cabbage		x	x
Cauliflower		x	x
Carrot		x	x
Chard	x	x	x
Corn, sweet			x
Cucumber	x	x	x
Eggplant	x	x	x
Greens		x	x
Herbs	x	x	x
Kohlrabi		x	x
Leek	x	x	x
Lettuce	x	x	x
Muskmelon			x
Onion	x (green)	x	x
Parsley	x	x	x
Pea		x	x
Pepper	x	x	x
Potato, irish			x
Potato, sweet		x*	x
Pumpkin		x (bush-type)	x
Radish	x	x	x
Rhubarb		x	x
Squash, summer	x	x	x
Squash, winter		x (bush-type)	x
Tomato	x	x	x
Turnip		x	x
Watermelon			x

*Requires frequent watering and treated as an ornamental

Outdoor Gardening

Stop by any public library, garden center, or Extension Service office and you're sure to find all kinds of information about gardening outdoors. Encourage young people to use these resources to find answers to their questions. Learning how to learn and gather information is an important life skill that you can help foster in youth.

The general information provided here elaborates on the information found in the youth activity guides. You may want to use this information to help guide youth in their outdoor gardening experiences.

Selecting a Garden Site

For growing flowers, almost any site can be used as long as the plants selected are suitable for the amount of sun received and for the type of soil at the site. Young people who want to grow vegetables or flowers that require a lot of sun should select a site with these characteristics:

- a minimum of 5-6 hours of sunlight; day-long sun is often ideal.
- almost level ground so that rain will not wash away seeds and plants. A gentle slope, however, helps drainage. Avoid low-lying areas where water collects.
- a nearby faucet for watering
- soil that is fairly free of rocks

Inexperienced gardeners often plant more vegetables than they can care for or consume. Careful thought should be given to the amount of time available for gardening and/or the amount of produce desired.

Preparing the Ground

If soil is dug too wet, its texture will suffer and so will plants. The soil should thaw and dry a bit in the spring before it is worked. It can be tested by gathering a ball of soil in a fist. It should shatter and crumble when dropped. It should feel mealy, not sticky, when rubbed between the fingers.

Youth can use a spade or garden fork to turn the soil, breaking up the chunks of soil as they are turned. Select the size gardening tool that is appropriate for the user. Soil-improving ingredients such as compost, peat, and/or manure can be spaded or raked into the top few inches of soil.

The aim is to have fertile soil to support the plants and a good supply of humus (decayed plant matter) to hold water, improve soil texture, and nourish the soil's helpful fungi and bacteria. Plant nurseries and other stores sell peat moss (humus), bagged dehydrated manure (nutrients and some humus), and fertilizers (nutrients). Home compost can also supply nutrients and humus.

After adding soil improvers, the soil should be raked smooth. For large gardens, a rotary garden tiller can be used by an adult to prepare the soil. Tillers can be rented from a garden center or other rental agency.

What to Plant

Youth are likely to prefer planting the vegetables that they like to eat and the flowers that they find attractive. They will also need to choose plants that are appropriate for the local climate.

Youth should read details on seed packets, in catalogues, and in Extension publications to determine what plants are appropriate and when they should be planted based on the local climate. Some vegetables prefer cooler weather, while others prefer the warmer parts of summer. Some vegetables that prefer cooler weather will not grow well during the hottest part of the summer.

Options for planting include direct seeding in the garden, starting seeds indoors and then transplanting to the garden, and purchasing transplants to plant immediately in the garden. Transplants for long-season, warm-weather vegetables and flowers are often preferred in northern regions of the United States.

How to Plant

Basic information about how to plant a garden can be found in the Unit I activity guide. These more specific instructions will also help you.

Direct Seeding—Seeds for cold-hardy vegetables and hardy annual flowers can be sown directly in the garden.

1. Prepare soil for planting.
2. For rows of plants, stretch a string between two stakes to mark straight rows.
3. Using a hoe, make a shallow furrow.
4. Scatter seeds evenly in the furrow.
5. Rake fine soil over the seeds. Press soil gently but firmly over seeds with rake or walk lightly over the row.
6. Sprinkle the row lightly with water.
7. Row markers will help to record variety and planting date information.

Transplants—These are best planted in the garden in the late afternoon to avoid the heat. About an hour before planting, plants should be carefully watered.

Spacing directions for specific plants should be followed. Holes should be dug wider and deeper than the plant and its clinging soil. Small rocks and sticks can be removed from the hole. Plants can be separated with a trowel, knife, or hands, keeping as much soil with roots as possible. The plant should be set at the same depth at which it was growing in the container. The hole should be filled with soil and pressed firmly around the roots.

Plants should be watered just enough to moisten the ground. The ground should not be saturated. For plants that need support, stakes should be put in place now rather than waiting. Plants should be watered again several days after planting if there has been no rain.

Taking Care of the Garden

Seeds planted in the spring usually take two weeks or more to sprout. Transplants that have been set out may look unhealthy for a week or so while their roots get reestablished. Later, they will recover and produce new growth. Youth need to understand that caring for plants is an ongoing process. Encourage them to follow these steps to ensure continued growth:

Thinning: Crowded plants don't develop well, so thin them to the recommended spacings within rows. Some vegetables, like lettuce, can be thinned gradually as they grow so that the thinned plants can be eaten.

Weeding: Every garden has some weeds. But when there are too many, they compete with other plants for food and moisture. Control weeds by hoeing, rototilling, or mulching.

Mulching: Mulch materials include hay, leaves, dry grass clippings, newspaper, cut-up cardboard, wood chips, or straw. Organic mulches such as straw, hay, leaves, and grass clippings should be put down to a depth of 2 to 3 inches. Several sheets of newspaper or a single layer of cardboard can also serve as adequate mulch. Mulch helps retard weed growth, conserve moisture, regulate soil temperature, and keep fruit clean.

Watering: Ideally, vegetables and many flowers should receive 1 inch of water a week, either from rain or sprinkling. If plants are sprinkled, the soil should be soaked 4 to 6 inches deep. A good, deep watering is more beneficial than frequent light sprinkling.

Training and Staking: Plants that grow over 18 inches high benefit from being staked. Plants that vine can be trained to climb a string, net, or fence to conserve garden space.

Insect and Disease Control

There are many beneficial insects in a garden. Some help pollinate flowers and others destroy undesirable insects. Killing unwanted insects often wipes out helpful ones. Insect control should be done with care.

Two classes of insects generally attack plants in the garden. The first are sucking insects like aphids, red spiders, and mealy bugs. The second are chewing insects like beetles, certain worms, and grubs. Prevent insect problems by keeping the garden clean, checking for insects, and hand-picking these if possible. For massive infestations, insecticides can be used with appropriate caution.

Youth can control disease by planting disease-resistant varieties, keeping the plants healthy, and removing them from the garden once they are done producing.

Pesky Pests (page 28)

Your group members will want to use current resources to find treatment suggestions for each of the pest problems. The *Illinois Urban Pest Management Handbook*, a University of Illinois Cooperative Extension Service publication, is updated yearly and is an excellent reference.

.....

Unit 3

Herb Teacher (page 18)

Sample Teaching Plan

Activity: Planting herbs in containers

Supplies: Several different herb seeds in original packages, soil or potting mix, spoons, plant containers, water, paper towels

Do:

Explain that each person will plant herb seeds in a container and take the herbs home to grow. Tell learners to read information on seed packets to help them decide what to plant.

Share:

- How did you decide what to plant?
- What did you learn about planting seeds?
- Based on the information from the seed packet, how will you care for your seeds?

Processing:

- What was the most important thing in making your decision about what to plant?

Generalizing:

- Why is it important to have the facts before making a decision?

Applying:

- What are other times when you need to gather information before making a decision?

Exploring Careers (page 32) - sample jobs

Retail Businesses

Florist
Grocery store owner
Nursery manager
U-pick operator

Education

Plant science instructor
Gardening journalist
Extension agent
Master gardener

Wholesale Businesses

Tree farm manager
Commerical vegetable farm manager
Mail-order business owner
Seed supplier

Services

Professional lawn and garden servicer
Interiorscaper
Park ranger
Landscaper

Resources

Extension Service Publications

Alternatives in Insect Management: Botanical Insecticides and Insecticidal Soaps. University of Illinois, College of Agriculture, Cooperative Extension Service Circular 1296.

Biological Control of Insects. University of Illinois, College of Agriculture, Cooperative Extension Service Circular E2543.

Home Fruit Pest Control. University of Illinois, College of Agriculture, Cooperative Extension Service Circular 1145.

Illinois Fruit and Vegetable Garden Schedule. University of Illinois, College of Agriculture, Cooperative Extension Service Circular 1262.

Illinois Urban Pest Management Handbook. University of Illinois, College of Agriculture, Cooperative Extension Service. Updated yearly.

Insect Pest Management for the Home, Yard, and Garden. University of Illinois, College of Agriculture, Cooperative Extension Service J-7.

Keith, Rebecca, and F.A. Giles. *Dwarf Shrubs for the Midwest.* University of Illinois, College of Agriculture, Cooperative Extension Service Circular 469.

Morrissey, Sharon, and F.A. Giles. *Large Flowering Shrubs for the Midwest.* University of Illinois, College of Agriculture, Cooperative Extension Service Special Publication 74.

Ornamental Grasses for the Midwest. University of Illinois, College of Agriculture, Cooperative Extension Service Circular 461.

Vandemark, J.S., and C. Voigt. *Vegetable Gardening for the Midwest.* University of Illinois, College of Agriculture, Cooperative Extension Service Circular 1331.

Voigt, Thomas, and F.A. Giles. *Groundcovers for the Midwest.* University of Illinois, College of Agriculture, Cooperative Extension Service Circular 400.

Walker, Mary C., and F.A. Giles. *Flowering Trees for the Midwest.* University of Illinois, College of Agriculture, Cooperative Extension Service Special Publication 68.

Wilt Disorder of Cucurbits. University of Illinois, College of Agriculture, Cooperative Extension Service Circular NCR261.

4-H Plant Science Units (Indoor Gardening, Vegetable Gardening, Landscape Gardening, Hydroponics, Horticulture Judging and Identification). Cooperative Extension Service, College of Agriculture, Penn State University, State College, PA.

Books

Burpee Expert Gardener Series. New York: Macmillan, inc.

Cohen, J., and E. Pranis. (1990). *Growlab Activities for Growing Minds*. Burlington, VT: The National Association for Gardening.

Dirr, Michael A. (1975). *Manual of Woody Landscape Plants*. Champaign, IL: Stipes Publishing Co.

Fell, D. (1990). *A Kid's First Book of Gardening*. Philadelphia, PA: Running Press.

Hartmann, Hudson T., and Dale E. Kester. (1983). *Plant Propagation*. Englewood Cliffs, NJ: Prentice-Hall.

Henry, W. A. (1991). *The Wildflower Gardener's Guide*. Pownal, VT: Storey Communications, Inc.

Ocone, L., and E. Pranis. (1990). *The National Gardening Association Guide to Kids' Gardening*. New York: Wiley Science Editions, John Wiley & Sons.

Ortho Gardening Series (All About Vegetables, All About Annuals, All About Bulbs, All About Perennials, All About Roses). San Francisco, CA: Chevron Chemical Company.

Powell, C.C., and R. Rosetti. (1992). *The Healthy Indoor Plant*. Columbus, OH: Rosewell Publishing.

Rafferty, K. (1989). *Kidsgardening: A Kids' Guide to Messing Around in the Dirt*. Palo Alto, CA: Klutz Press.

Rodale's Illustrated Encyclopedia of Herbs. (1987). Emmaus, PA: Rodale Press.

Solit, Karen. (1985). *Keep Your Gift Plants Thriving*. Pownal, VT: Storey Communications.

Still, Steven M. (1980). *Manual of Herbaceous Ornamental Plants*. Champaign, IL: Stipes Publishing Co.

Sunset Books and Sunset Magazine, Editors. *Sunset Gardening Series*.

Taylor's Guides (*Taylor's Guide to Houseplants*, *Taylor's Guide to Annuals*, *Taylor's Guide to Bulbs*, *Taylor's Guide to Perennials*). (1987). Boston, MA: Houghton Mifflin Company.

The Organic Gardener's Complete Guide to Vegetables and Fruits. (1982). Emmaus, PA: Rodale Press.

BEST COPY AVAILABLE

Periodicals

Fine Gardening, The Taunton Press, Inc., P.O. Box 5506, Newton, CT 06470.

Flower and Garden, 4251 Pennsylvania Avenue, Kansas City, MO 64111.

Horticulture, Subscription Department, P.O. Box 2595, Boulder, CO 80323.

Organic Gardening, Rodale Press, Inc., 33 E. Minor Street, Emmaus, PA 18049.

The Herb Companion, Interweave Press, Inc., 201 East Fourth Street, Loveland, CO 80537.

The Herb Quarterly, P.O. Box 275, Newfane, VT 05345.

Fiction Books

Aliki. (1976). *Corn is Maize: The Gift of the Indians*. New York: Crowell Junior Books.

Bosse, M.J. (1979). *79 Squares*. New York: Crowell.

Burnett, F.H. (1971). *Secret Garden*. New York: Dell Publishing.

Carle, E. (1970). *The Tiny Seed*. New York: Crowell Co.

Domanska, J. (1969). *The Turnip*. New York: MacMillan.

George, E. (1981). *Please Don't Step on Me*. Cherokee, NC: Cherokee Publications.

Haywood, C. (1980). *Eddie's Green Thumb*. New York: William Morrow and Co.

Hoban, R. (1964). *Bread and Jam for Francis*. New York: Harper & Row.

Keller, B. (1976). *The Beetle Bush*. Lyndhurst, NJ: McCann and Geoghegan, Inc.

Kellog, S. (1988). *Johnny Appleseed: A Tall Tale*. New York: Morrow Junior Books.

Lobel, A. (1984). *Potatoes, Potatoes*. New York: Harper & Row.

McCloskey, R. (1976). *Blueberries for Sal*. New York: Puffin.

McGee, M. (1977). *Willie's Garden*. Emmaus, PA: Rodale Press, Inc.

Palmisciano, D. (1989). *Garden Partners*. New York: Atheneum.

Rylant, C. (1984). *This Year's Garden*. Scarsdale, NY: Bradbury Press.

Sharmat, M. (1980). *Gregory, The Terrible Eater*. New York: Macmillan.

Snow, P. (1985). *Eat Your Peas, Louise*. Chicago: Children's Press.

People

- College faculty
- Extension educators
- Extension program assistants
- Florists
- Grandparents, parents, family members
- Greenhouse managers
- Industry representatives
- Master gardeners with CES
- Park rangers
- School and public librarians
- Store owners
- Teachers

Other Resources

- Advertisements
- Cassette tapes
- Catalogs
- Charts
- Comics and cartoons
- Commercial or make-your-own games
- Encyclopedias
- Library pamphlet files
- Magazines, books, newspapers
- Newsletters kids write
- Package labels
- Yellow pages
- Videotapes

Internet Sites:

Garden Gate

<http://www.prairienet.org/ag/garden/homepage.htm>

New York Botanic Garden

<http://www.pathfinder.com/vg/Gardens/NYBG/index.html>

Michigan State University

<http://www.msue.msu.edu>

Ohio State University

<http://www.hortwww-2.ag.ohio-state.edu>

University of Illinois Horticulture Classes

<http://classes.aces.uiuc.edu/Hort100/>

Virtual Garden

<http://pathfinder.com>

Hartley Garden at UI Arboretum

<http://w3.ag.uiuc.edu/HORT/arb-broc.html>

Purdue University

<http://flowers.hort.purdue.edu>

GardenNet

<http://www.olympus.net/gardens/welcome.html>

The Horticultural Web

<http://www.horticulture.com>

University of Illinois Horticulture Fact Sheets

<http://w3.ag.uiuc.edu/HORT/extension/factshts/fact.sheets>

Biological Control: A guide to natural enemies in North America

<http://www.nysaes.cornell.edu/ent/biocontrol>

Check These Out

National Junior Horticulture Association
1424 N. Eighth St.
Durant, OK 74701

National Gardening Association
180 Flynn Avenue
Burlington, VT 05401

Children's Gardening Resource Directory
AHS Education Dept.
7931 E. Boulevard Dr.
Alexandria, VA 22308



College of Agricultural, Consumer and Environmental Sciences

University of Illinois at Urbana-Champaign

Copyright 1996 by University of Illinois Board of Trustees

Authors and publishers have granted permission for copies of this work or parts of this work to be reproduced, provided that (1) copies are distributed at or below the cost of reproduction; (2) the author, the publication, and the University of Illinois College of Agricultural, Consumer and Environmental Sciences and the relevant division within the College are identified; and (3) proper notice of copyright is affixed to each copy.

4-H Publication LJ0601

September 1996



Cooperative Extension Service
University of Illinois at Urbana-Champaign

In furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, D.R. Campion, Interim Director, Cooperative Extension Service, University of Illinois at Urbana-Champaign. The Illinois Cooperative Extension Service provides equal opportunities in programs and employment.



Budding Gardeners

A black and white illustration of a group of children participating in a gardening project. In the foreground, three children are judging a snake-shaped garden sculpture made of coiled garden hoses, labeled A, B, and C. One child holds a clipboard labeled 'JUDGE #1', another 'JUDGE #2', and a third 'JUDGE #3'. In the background, a boy holds a sign that says 'X-PERIMENTS WITH PLANTS' and another boy holds a 'TEST RESULTS' card. A girl is writing on a 'PLANT SEARCH' board. Several potted plants are on a table.

Name _____ Age _____ County _____

Contents

Note to the Project Helper	3
Horticulture Fun.....	4
Plans and Highlights	5
My Horticulture Achievements: Unit 1	6

Plant Basics

Life Skill: Learning to Learn

Plant Parts	8
Seed Power	10
Hold the Water	12
The Scoop on Rot	14
Mystery Movement	16

Plant Talk

Life Skill: Communicating with Others

Learning About Plants	18
Plants from Parts	20
Flower Gardening.....	22
Flower Arranging	24

Fun to Grow On

Life Skill: Planning and Organizing

Plant a Dish Garden	26
Container Veggies	28
Outdoor Gardens	30

Going Hands On

Life Skill: Making Decisions

Food For the Table	32
Exhibiting	34

Glossary	36
Resources	37
Exhibiting Tips	38

Note to the Project Helper

Welcome to the 4-H horticulture project. As a project helper, you have an important role in guiding, supporting, and encouraging youth. This project guide is designed to help youth actively explore the world of horticulture. It includes hands-on horticulture activities for both indoor and outdoor fun.

Horticulture Project Guides

The three 4-H horticulture project guides are designed for beginning, intermediate and advanced learners. In each lesson, you will find a learning activity that emphasizes a project skill and a life skill. This Level 1 project focuses on four life skills: learning to learn, communicating with others, planning and organizing, and making decisions.

Each project guide includes *Let's Explore* activities designed to help youth learn by doing. The *Talking It Over* sections help youth process what they have learned as they discuss the experience with you. Keep in mind that most of the questions in this section will not have a right or wrong answer. Your goal is to help youth clarify and expand on their own ideas. *Take a Challenge* sections provide additional learning activities for youth to explore. Encourage youth to enhance their project experience with these challenging activities. Each project guide also includes an achievement program to recognize youth for their accomplishments.

Leader's Guide

The 4-H horticulture series also includes a Leader's Guide. This publication provides more specific content information as well as fun learning activities for groups. These group activities are suitable for families, classrooms, 4-H project groups, or other clubs and groups. You will also find information about the experiential learning model and how to use it to promote life skill development.

4-H: Experiential Learning

This learning method—doing an activity, reflecting on the experience, and applying the new knowledge—is called the **Experiential Learning Model**. This model is what makes 4-H youth development education different from other formal education methods. Each lesson in the 4-H horticulture series uses experiential learning to help youth get the most out of their learning experiences.



As you can see from the diagram above, youth start by completing an activity on their own. Then, you meet together to talk about the experience. With your guidance, youth reflect on what they did and how they can apply the learning to other situations. This method may seem different at first, but with your efforts young people will soon become comfortable with the process and learning will go well beyond horticulture. Good luck!

Horticulture Fun

Welcome to 4-H horticulture. In this Level 1 project, you will explore fun ways to grow plants both indoors and outdoors. You'll grow sprouts and vegetables that you can eat. You'll plant flowers and then use them to learn about pollination. You'll design your very own dish garden and flower arrangement. You'll grow vegetables in a garden or in containers. You'll even do some fun experiments that will help you become a plant expert. All kinds of exciting opportunities await you in the 4-H horticulture project. Set high goals for yourself and see just how far you can go.



Horticulture 1 Project Guidelines

- Do at least four required activities and three challenge activities each year.
- Complete Level 1 within three years.
- Participate in at least three of the learning experiences listed on page 5 each year.
- Record project goals and accomplishments.
- Practice the life skills emphasized in this unit: learning to learn, communicating, planning and organizing, and making decisions.

Horticulture Activity Guide

The activities in this guide will give you new challenges to explore. Work with your project helper to complete each activity. Remember, this guide is not designed to provide you with answers to all of your questions. Learn to find and use resources such as gardening books, videos, Extension Service educators, other gardeners, and horticulture professionals.

Record your goals and work in this guide. A written record will be useful as you progress through Level 1. It will also reflect all that you have learned and accomplished in the project.

Your Project Helper

Your project helper will be a great resource for you. Choose someone who will support your efforts to complete the horticulture achievement program. Your helper will meet with you to set goals, suggest resources to use, and give feedback as you complete each activity. Write the name and phone number of your helper below.

Project
Helper: _____
Phone: _____

Plans and Highlights

Horticulture Project Goals

Name _____

Goals for the Level 1 horticulture project:

Year _____

Year _____

Year _____

Horticulture Highlights

Date and list important things you do and learn.

Major Learning Experiences

Date any of these things that you do.

Year	Year	Year	Activity
			Give a public presentation
			Attend a horticulture show
			Attend a horticulture clinic
			Participate in a horticulture judging contest
			Tour a horticulture business
			Attend a horticulture project meeting
			Exhibit at a fair
			Your own activity

My Horticulture Achievements: Unit 1

Directions:

1. Do at least four required activities and three challenge activities each year.
2. Finish at least 20 activities in three years to complete this level.
3. Date each activity when you complete it and have your project helper initial it.

Required: Complete at least four of five activities in the section, *Plant Basics*.

Helper	Date	Activity
		Plant Parts
		Seed Power
		Hold the Water
		The Scoop on Rot
		Mystery Movement

Required: Complete at least three of the four activities in the section, *Plant Talk*.

Helper	Date	Activity
		Learning About Plants
		Plants from Parts
		Flower Gardening
		Flower Arranging

Options: Complete any of the challenges on pages 8 to 17, or write your own challenge.

		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Write your own challenge here:

Options: Complete any of the challenges on pages 18 to 25, or write your own challenge.

		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Write your own challenge here:

Required: Complete at least two of the three activities in the section, *Fun to Grow On*.

Helper	Date	Activity
		Plant a Dish Garden
		Container Veggies
		Outdoor Gardens

Required: Complete at least one of the two activities in the section, *Going Hands On*.

Helper	Date	Activity
		Food for the Table
		Exhibiting

Options: Complete any of the challenges on pages 26 to 31, or write your own challenge.

		Take a Challenge page ____ #____
		Take a Challenge page ____ #____
		Take a Challenge page ____ #____
		Take a Challenge page ____ #____
		Take a Challenge page ____ #____
		Write your own challenge here:

Options: Complete any of the challenges on pages 32 to 35, or write your own challenge.

		Take a Challenge page ____ #____
		Take a Challenge page ____ #____
		Take a Challenge page ____ #____
		Take a Challenge page ____ #____
		Write your own challenge here:
		Write your own challenge here:

I certify that _____ has completed the Level 1 horticulture project.

Project Helper's Signature _____ Date _____

Plant Basics

Did you know that learning can be exciting and fun? There are lots of different ways to learn. Reading, listening, watching and doing are all ways to learn new things.

In this section, you will learn lots of new things in lots of new ways. You can use these new ways of learning in school, at home and with your friends.

Plant Parts

Everyone knows that a plant has roots, leaves and a stem. But do you know what those parts do? They each have an important job in helping the plant grow. Knowing the parts of a plant and how they work together will help you as you grow plants. In this activity you will learn about plant parts and what they do.

Life Skill:
Learning to learn

Project Skill:
Identifying plant parts and their functions

What to Do:
Complete the plant part word match

Let's Explore

Unscramble the plant parts on the left. Then, draw a line from each part to its job on the right. Finish the activity by labeling the plant on the next page with six of the

plant parts that you have learned. Two of the parts are not shown on the plant. After you complete the activity, share what you have learned with your helper.

emts _____
rlofew _____
irtfu _____
otor _____
afel _____
esde _____
mlepoh _____
rubte _____



What Am I?

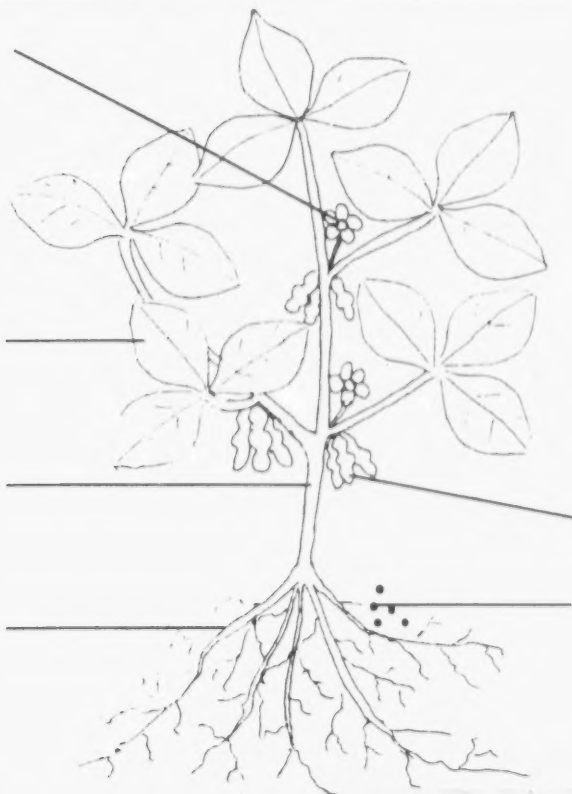
1. My job is to anchor the plant and absorb water and nutrients.
2. I help the plant stand up straight.
3. My job is to carry food the plant has made.
4. I produce the seeds for new plants.
5. I protect and scatter the plant's seeds.
6. My job is to start a new plant.
7. I am a short underground stem that can make a new plant.
8. I turn sunlight into food for the plant.

Talking It Over

Share What You Learn

- Which plant parts did you already know?
How did you find answers that you needed?
- What do each of the plant parts do?
- Why is it important to learn about the different parts of a plant?

How can you use the facts you have learned about plant parts?



Use What You Learn

How do games, like word scrambles and crossword puzzles, help you learn and remember new information?

What are the best ways for you to learn?



Take a Challenge

1. Find out about bulbs, rhizomes, corms and tubers. These plant parts grow underground but are not roots. What are they?

Seed Power

You probably know that many plants grow from seeds. But have you ever wondered just how it happens? Seeds need at least three things to start growing: water, air and the right temperature. When seeds have the correct growing conditions, they germinate or sprout. In this fun activity, you will grow some edible sprouts and find out what happens when seeds do not have the right conditions for germination.

Life Skill:
Learning to learn

Project Skill:
Exploring germination

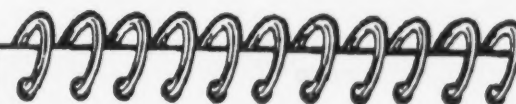
What to Do:
Grow sprouts in different places and record what happens

Let's Explore

Get some soybean, mung bean, lentil or alfalfa seeds from a grocery or health food store. Put a one-inch layer of sprouting seeds in the bottom of two clean glass jars. Cover the jar openings with cheesecloth. Secure the cheesecloth with rubber bands or screw-top rings. Rinse the seeds with cold water and drain them. The cheesecloth will keep the seeds in the jars. Soak the seeds in lukewarm water for 12 to 16 hours. Drain off the water. Rinse and drain them again with lukewarm water.

Then place one jar in a dark place at room temperature, about 70 degrees. Place the other jar in a cool dark place such as a refrigerator. Rinse and drain the seeds in both jars 2 to 4 times a day. Watch as the seeds germinate. Compare the seeds in the two different places. How did temperature affect germination? Write or draw what you see.

You can use the sprouts in salads, on sandwiches, and in soups and vegetable dishes. Just wash the sprouts thoroughly to remove the seed husks and enjoy!



Where Container 1 was:

What I saw:

Where Container 2 was:

What I saw:

Talking It Over

Share What You Learn

- What happened to the seeds in the two different places?
- How does temperature affect germination?

Why is it important to know what seeds need for germination?

Use What You Learn

How does observing and comparing things help you learn?

In what other ways could you use your observation skills to learn?

The Science Scene

The right temperature is important for seeds to germinate. Many seeds sprout best in a warm place, about 70° F. to 75° F.

The right amount of water is also important. Seeds absorb water, causing the tissues inside to expand and break the seed coat. This allows the root and shoot to come out.

Seeds also need oxygen from the air. Just like you need oxygen for breathing, seeds need oxygen for germinating.

Most seeds are covered by soil and so they germinate in darkness. But, some seeds need light in order to germinate. These seeds are sprinkled over the soil, but are not covered. Lettuce, strawberry and begonia are examples of seeds that need light for germination.



Take a Challenge

1. Do all seeds sprout if they have the right conditions? Conduct an experiment to answer this question.
2. Design a poster to show how seeds germinate.

Hold the Water

Plants are a lot like people. Just like you, plants need certain things in order to live. Plants need light, water, air, nutrients and the right temperature for growing. But what happens if a plant gets too much of a good thing? Think about how you feel when you drink too much water or eat too much food. Just like in humans, too little or too much of something can harm a plant. In this activity, you will see what happens when a plant doesn't get the right amount of water.

Life Skill:
Learning to learn

Project Skill:
Learning what plants need

What to Do:
Conduct an experiment to see how much water a plant needs

As you do the activity, think about all the things you do to help your body grow healthy and strong.

Let's Explore

You know that plants need plenty of water to grow. But how much is enough? Set up an experiment with three small plants. Put all three plants in the same place. Then give each plant a different amount of water for 4 weeks. Record the results and share what happened with your helper.



What Happened

Plant #1

Give 1 teaspoon water per week

Plant #2

Water plant as needed

Plant #3

Give 3 tablespoons water per day

Talking It Over

Share What You Learn

- What happened to each plant?
- How do some plants adapt themselves to live with limited water?
- Why is it important to know how to take care of plants?

When are other times when too little or too much of something could harm a plant?

Use What You Learn

How is learning to care for plants like learning to care for yourself?

What are some things you can do to make sure your body gets what it needs?

The Science Scene

Water is a basic need of all plants. Water carries dissolved nutrients into the plant through the roots. Plants also need water for the process of photosynthesis. Water pressure in plant cells also supports stems and leaves. How do you know when to water a plant? Most gardeners agree that a plant needs water when the soil feels dry to the touch.

If a plant doesn't get enough water, it wilts and eventually dies. Too much water can make a plant yellow and stunted. Too much water can also cause a plant to die.



Take a Challenge

1. Find out how much water and light your favorite plant needs to grow.
2. Conduct an experiment to find out what happens when a plant doesn't have enough light.

The Scoop on Rot

You know how important good soil is for growing plants. Plants get the nutrients they need from soil. But did you know that you can make soil higher in nutrients by adding compost? Things that were once alive, like plants and animals rot or decompose after they die. They form a natural fertilizer called compost that is great food for plants. In this activity, you will find out what kinds of things rot and form compost.

Life Skill:
Learning to learn

Project Skill:
Learning about composting

What to Do:
Make and observe a compost column

Let's Explore

You need: two 2-liter plastic soft drink bottles; marking pen; knife; scissors; sharp needle; electrical tape or duct tape; netting or cheesecloth; rubber band; 2 cups garden soil; 2 cups test ingredients.

1. With an adult helper or parent, build the compost column.
2. Combine soil and at least two of the following test ingredients: pieces of plastic or foam cup; grass clippings and/or leaves; carrot, lettuce, potato or fruit peelings; 2 paper clips; bread crumbs; shredded paper. Do not use meat or dairy scraps.
3. Place the mixture of soil and test items in the middle bottle (section 2). Add water to moisten the soil and allow a few drops to drain into the bottom of the column.
4. Keep the soil moist during the composting process by adding the water created at the bottom of the column back in the top. Turn over the soil with a spoon once a week.
5. Open the compost column one month later and pass the contents through a screen or mesh strainer.
6. Which test ingredients decomposed? Did any ingredients stay the same?

Building a Compost Column

On the first bottle:

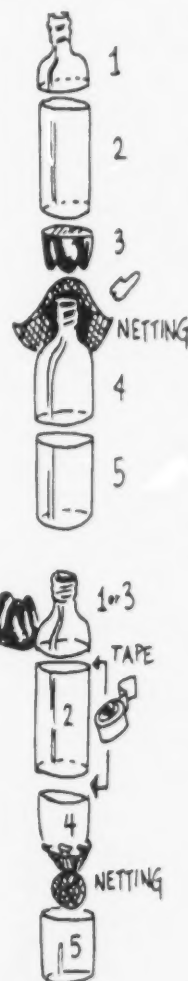
- Cut 3 inches off the bottom.
- Cut 4 inches off the top.

On the second bottle:

- Cut off the top third of the bottle.
- Attach a piece of netting or cheesecloth around the bottle neck and secure with a rubber band.

Assemble the column:

- Turn section 4, the one with the netting, upside down and place in section 5.
- Slide section 2 into section 4 and secure with tape.
- Add either section 1 or 3 to section 2, making a lid.
- Secure with tape.
- Punch 10 air holes throughout the bottle.



Talking It Over

Share What You Learn

- What happened to the materials that you put in the compost column?
- What kinds of things do not decompose?

How can you use what you have learned about composting in gardening activities?

Use What You Learn

How can learning about decomposition help you take care of the environment?

What are some ways that you keep food from decomposing?

The Science Scene

Decomposition is a necessary part of nature. After all, decomposition is nature's way of recycling itself. But just how does it happen?

Tiny microbes, like fungi and bacteria, do all the work. These decomposers live in soil and break down the dead plants and animals into smaller parts. What you get is organic matter. As the decomposers break down once-living things, they help release nutrients back to the soil. New plants use these nutrients for food and the cycle starts all over again.

COMPOST INGREDIENTS

Egg shells, Straw,
animal manure,
wood ashes, nutshells,
Corn stalks, pine
needles, fish meal
Seaweed...

HERE ARE SOME THINGS
I CAN USE TO MAKE
COMPOST.



Take a Challenge

1. See if composting is available in your community. How is the compost used?
2. Grow the same kind of plant in two pots. Add compost to one plant, but not to the other. Compare the results.

Mystery Movement

Plants don't move around like humans and animals, but they do move. They move so slowly that you do not notice the motion. Plants move in response to light, water, gravity, chemicals, temperature and touch. These responses are called tropisms. In this activity, you will learn about phototropism, geotropism and hydrotropism.

Life Skill:
Learning to learn

Project Skill:
Learning about tropisms

What to Do:
Observe a plant tropism

Let's Explore

Conduct at least one of these observation activities to find out how plants respond to light, water and gravity. On the next page, draw your observations of the activity.



Phototropism

You need: a house plant with large leaves. Put a house plant with large leaves in the sunniest window in the house for three or four days. Look at it carefully to observe what direction the tops of the leaves are facing. Turn the plant exactly half way around. Check it again three or four days later. What has happened to the leaves?

Geotropism

You need: two potted plants of the same kind, such as coleus or geranium, at least four inches tall.

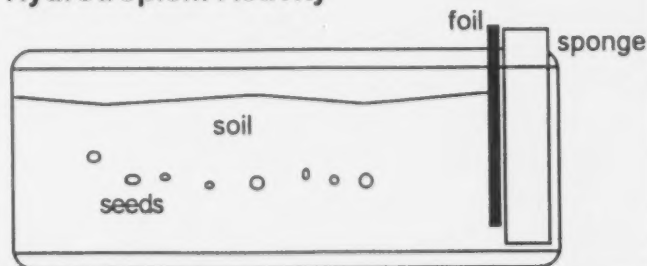
Place both of the plants on a shelf in a dark closet. One plant should be left upright. Carefully lay the other plant on its side. Put a paper towel under it to catch any spilled soil. Observe the plants each day for a period of three to four days. What direction do the plants grow?

Hydrotropism

You need: a glass baking dish, potting soil, a flat sponge, water, aluminum foil, and a package of radish, bean or corn seeds.

Place the sponge upright at one end of the baking dish. Spread a sheet of aluminum foil against it, but leave the bottom inch of the sponge exposed. Fill the rest of the container with loosely packed soil. Plant seeds along the sides of the container so that you will be able to see the roots grow. Keep the soil moist until the seedlings are growing. Then stop watering the soil, but keep the sponge moist for several days. Look at the roots through the side of the container. What happens to them?

Hydrotropism Activity



My Tropism Observations

Kind of Tropism: _____

Talking It Over

Share What You Learn

- What did you learn about plant tropisms?
- Did any of the results surprise you?

Why is it important to know about plant tropisms for gardening?

Use What You Learn

How does drawing what you observe help you learn and remember?

What are other situations when you might use a drawing to help you learn something new?

Take a Challenge

1. Find out how plants respond to chemicals, temperature and touch.
2. Design an experiment to see if plants respond to fluorescent light in the same way as sunlight.

Plant Talk

Communicating is something you do every day. Listening, talking and showing are just a few of the ways that you communicate.

The activities in this section will help you develop your communication skills by talking with others about plants.

Learning About Plants

Plants come in different shapes and sizes. Plants also need different things to grow. Some need lots of sunshine; others need shade. Some plants grow well indoors, while others grow best outside. You can learn about plants in lots of different ways — by reading books, visiting a garden center or talking with people who grow plants. In this activity, you will find information about plants that you would like to grow.

Life Skill:

Communicating with others

Project Skill:

Gathering facts about plants

What to Do:

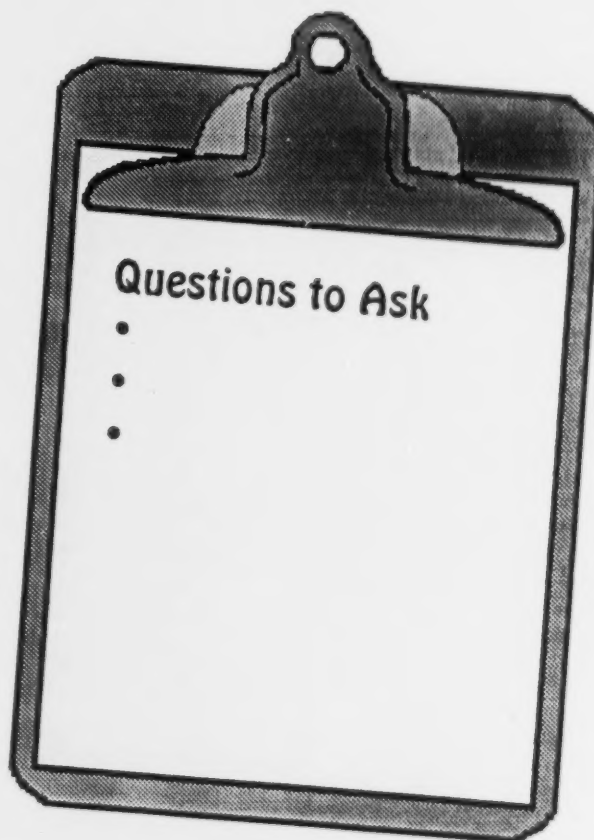
Interview people who grow plants

Let's Explore

Make a list of three people you could talk to about growing plants. Then think about what you want to find out. Would you like to learn more about growing plants indoors? Or are you more interested in an outdoor garden? Write down questions you want to ask. Some sample questions are listed below to help you get started. After you have your questions ready, interview the gardeners. Write down important information that you want to remember.

Sample Interview Questions

- What kinds of plants do you grow?
- Where do you grow plants?
- What kinds of plants would you suggest for a beginning gardener?



Plants to Try

Plant Name

Where to Grow

Things to Remember

Talking It Over

Share What You Learn

- What did you learn about growing plants that was new to you?
- How did it feel to interview people about their plants?

How can talking with other gardeners help you decide which plants to grow?

Use What You Learn

Why is it helpful to get ideas and opinions from other people?

How can you use your communication skills to help you make future decisions?

Take a Challenge

1. Take pictures of different plants you see growing in your neighborhood. Under each picture, list the name of the plant and where it was growing.

Plants from Parts

Did you know that plants can do something that humans can't do? A plant can grow a whole new plant from one of its parts. Growing a new plant from a root, leaf or stem is called propagation. Why grow new plants this way? Some plants, like bananas, naval oranges and seedless grapes, never produce seeds that will grow. Without propagation, we would not have these fruits. Another reason to propagate plants is to get new plants fast. Starting plants from parts

Life Skill:
Communicating with others

Project Skill:
Learning about propagation

What to Do:
Start a plant from a cutting and show others how to do it

is faster than starting them from seed. In this activity, you will propagate a plant and show others how to do it.

Let's Explore

With your helper, start a new plant from a plant part. You can do the stem cutting below or use another method you have

learned. Complete the activity by showing your family or a friend how to start a new plant from a plant part.

Stem Propagation

You need: a plant, glass jar, sharp knife, 2 flower pots or containers with drain holes, sand or vermiculite, garden soil

1. Cut about 4 inches off a plant stem. Get several nodes on this stem.
2. Trim off all but two or three leaves.
3. Place the cut end of the stem in a pot filled with moist sand or vermiculite. Press the sand or vermiculite firmly around the stem.
4. Place a glass jar over the cutting to keep in moisture. Set the cutting in a light place, but not in direct sunlight. Add water as needed to keep the sand moist.
5. When new leaves appear, remove the cutting from the pot. Ask your helper or parent to help you transplant it in a pot of good garden soil.



Talking It Over

Share What You Learn

- Discuss with your helper what you learned from doing the activity.
- How did you feel sharing the skills that you learned with others?

Why might one way of starting a new plant be better than another way?

Use What You Learn

Why is showing sometimes a better way to communicate than telling?

What other things can you do to practice your communication skills?

The Science Scene

What exactly is plant propagation? It is the controlled reproduction of plants by man. There are two kinds of propagation—sexual (seed) and asexual (vegetative). When a plant is grown from a seed, it has traits from two parent plants. But, when a plant is grown from a plant part, such as a stem, root or leaf, it has traits from only that parent plant. In asexual reproduction, the new plant is exactly the same as the parent plant. The new plant is a clone of its parent.



Take a Challenge

1. Visit with someone who works in a greenhouse. Learn about other ways to propagate plants.
2. Find out what kinds of plants can be started from roots and leaves. Grow plants using these propagation methods.

Flower Gardening

Flowers are a lot more than pretty colors and nice smells. Flowers have the important job of producing seeds for new plants. How does it happen? It's all in a process called pollination. During pollination, pollen is moved from the anther of a flower to the stigma of the same or another flower. In this activity, you will grow some flowering plants and use them to identify the parts of a flower.

Life Skill:
Communicating with others

Project Skill:
Learning about pollination

What to Do:
Plant flowers, identify flower parts and give a presentation

Let's Explore

First, see if you can find 11 flower parts in the word search. The parts are shown on the next page. Then with a parent or helper, plant several different kinds of flower seeds or young plants in containers or in a garden. Follow the directions on the seed packet or young plants. When the plants bloom, pick a few of the flowers and carefully pull them apart to find the different parts. Complete the activity by giving a presentation on the parts and functions of flowers.

Flower Part Word Find

S O V E D P U D S T A M E N X
T Y X L H O R Y I E F G U S L
I U C D P L V P B S E B P K D
G V B F I L A M E N T F X V Q
M B D P S E R A U O V A R Y P
A E F D T N X N P S C Z L X D
V Q E L I W S T Y L E W V Z L
P E T A L U J H I U J P N D K
W V B N Q P I E Y V D J A L N
O V U L E S U R L N H P X L X

Presentation Title:

Introduction

Main Points

Summary

Talking It Over

Share What You Learn

- How did planting flowers and examining them help you learn about pollination?
- How did you feel about giving a presentation to your group?
- What did you learn about delivering a presentation?

Use What You Learn

What are good ways of explaining new things to a group?

How can you use your presentation skills at school or with other groups?

The Science Scene

Plants can't get up and move so how do they get their pollen to another plant? The answer is in the birds and bees. The color, scent and shape of flowers are designed to attract birds and insects.

Yellow, blue, violet and orange flowers seem to attract honeybees. Hummingbirds, on the other hand, are especially drawn to red.

Butterflies are attracted to sweet-smelling flowers in lots of different colors, and moths are attracted to flowers that are especially fragrant at dusk.

Even the shape of a flower can attract certain pollinators. If you look closely at a foxglove flower, you will see how a bee can fit right inside.



Take a Challenge

1. Make pressed flowers into gifts. Glue pressed flowers onto cardboard or heavy paper and frame the design.
2. Visit an orchard and find out how growers make sure flowers are pollinated.

Flower Arranging

Arranging flowers gives you a chance to express your creative side. You make a flower arrangement any time you use a plan or design to place flowers or leaves in a container. There are three common arrangement styles—the line, the mass, and the line-mass. In this activity, you will learn how to create a line arrangement and then demonstrate the steps to your group.

Life Skill:
Communicating with others

Project Skill:
Flower arranging

What to Do:
Make a line arrangement and give a demonstration

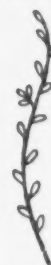
Let's Explore

You need: two long, curving branches and a few short branches of a shrub or tree, such as honeysuckle, yew or privet; 3 to 7 round flowers, such as a mum, zinnia or marigold; a container; and a piece of floral foam.

- Soak the foam in water for several hours or overnight.
- Place the foam in the bowl.
- Select a branch that has a graceful upright curve. Its length should be about 3 times the width of the container. Trim off any side shoots. Towards the back, insert 2 inches of the base of the stem into the foam. The branch should lean slightly to the back.
- Select another branch that repeats the curve of the first branch and is about two-thirds as long. Insert it next to the first one, either in front of, or behind the first one. The two branches should be close together for several inches before branch #2 curves to the left.
- The longest flower should be about half as long as branch #2. The flower should be a bud or only partly open. Stick this stem into the foam just to the right of branch #1. Let the flower or bud face up.
- Cut the stems of the other flowers so that they are all different lengths. Place them in the foam so that the smallest face upwards, with some of the larger ones facing right and others facing forward. Let some flowers be hidden by others.
- Finish the arrangement by placing a few short branches at the base. These branches and the lower flowers should hide the bowl.
- Complete the activity by showing your group how to make a simple line arrangement.



Before
Trimming



After
Trimming

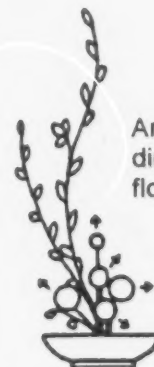


Good



Poor

Keep stems close
together at holder



Arrows show
direction
flowers face

My Demonstration

Title: _____

Main Points: _____

Summary: _____

Talking It Over

Share What You Learn

- Tell your helper about your demonstration.
- What did you do to prepare for your demonstration?
- What are the most important things to remember in giving presentations?

Use What You Learn

How does giving a demonstration help you improve your skills in flower arranging?

What can you do to improve your demonstration skills?

DOING DEMONSTRATIONS
IS A GOOD WAY TO PRACTICE
YOUR COMMUNICATIONS SKILLS



Take a Challenge

1. Make a flower arrangement and donate it to a local nursing home.
2. Participate in a flower arranging contest.

Fun to Grow On

Have you ever wanted to do something but didn't know quite how to start? Planning helps you organize ideas and the things you need in order to complete a new activity.

The fun activities in this section will give you a chance to practice and improve your planning skills.

Plant a Dish Garden

If you have ever visited a shopping mall, you've probably noticed all the plants that are growing inside. Trees, flowers and shrubs are carefully planned to make sure they will grow indoors. Growing plants inside your home takes the same kind of careful planning. In this activity, you will use your planning skills to make a dish garden.

Life Skill:
Planning and organizing

Project Skill:
Growing plants indoors

What to Do:
Plan and grow a dish garden

Let's Explore

First, make a list of the plants you will use. Choose plants that need the same amount of water and light. Next, decide where you will put your dish garden. Thinking about these things ahead of time will help you make the best choices for your garden. When you have your dish garden planned, ask your helper or a family member to show you how to plant a dish garden. Or, you can use these instructions to help you plant your garden.

You need: shallow container such as a dish, wooden crate, wicker basket or pan; hand trowel or old spoon; small pebbles or stones; plant charcoal, small plants, and potting soil (for a cactus or succulent garden, use a mixture of half potting soil and half sand). You can also add decorative items like rocks, seashells, cones, or feathers.

1. Clean the container. If the container is not waterproof, line with heavy plastic.
2. Place a 2-inch layer of charcoal in the bottom of the container. The charcoal prevents bacterial growth and odor.
3. On top of the charcoal place a half-inch layer of pebbles. This will help drainage if there are no drain holes in the container.
4. Next, add moist potting soil. Fill the container to within 1 inch of the top.
5. Use the trowel or spoon to make 1 hole in the soil for each plant. Leave a little space around each plant and leave space for any decorations you plan to use.
6. Take the plants out of their pots and put each one into a hole. Tap the soil down firmly around each plant.
7. Water the plants lightly.

Talking It Over

Share What You Learn

- What plants did you choose for your dish garden?
- What steps did you take in planting your garden?

How did planning ahead make the activity easier to do?

Use What You Learn

Why is it helpful to plan ahead before starting a new activity?

What are other times when planning and organizing would be helpful?

The Science Scene

How does everything in a dish garden work together to grow healthy plants? Drainage is very important for potted plants. If roots sit in too much water, they will develop a condition called root rot and the plant may die. A drain hole in the bottom of a container lets excess water run out. Gravel or pebbles can be used for drainage in containers that do not have holes. Plant charcoal is another important element in a dish garden. Charcoal prevents bacterial growth and odor. Potting soil provides the nutrients that the plants need.



Take a Challenge

1. Plant a dish garden and donate it to a hospital, nursing home, church or some other place in your community.
2. Design an experiment to compare the growth of two different plants in identical dish gardens.

Container Veggies

Do you like the idea of growing your own vegetables but don't have space for a garden? No problem! Grow your veggies in containers. You can grow a pot of kitchen herbs, a hanging basket of tomatoes or a window box of fresh lettuce. Like garden plants, container vegetables need light, fresh air, water, fertilizer and good drainage. Planning is important for container gardening. You will need to choose a container, decide what to plant, and choose a place for your garden.

Life Skill:
Planning and organizing

Project Skill:
Growing vegetables in containers

What to Do:
Complete the container garden plan and plant vegetables in a container

In this activity, you will organize facts about container gardening and then grow vegetables in a container.

Let's Explore

With your family or helper, complete the plan below for a container garden. Then, using your plan, grow at least one vegetable in a container.



Container Garden Plan

Vegetable to Grow

Container to Use

Place to Put Container

Supplies

What To Do

Growing Tips

- Choose containers with drain holes.
- Place stones or crushed rock over drain holes to keep the soil in and prevent drain holes from getting plugged.
- Choose a container large enough for the plants you want to grow.
- Use a fertile potting soil.
- Choose plants that grow in a limited space. Peppers, tomatoes, parsley, cucumbers and chard are good choices.
- Use the proper amount of soil for your plant. Peppers and chard need about 2 gallons of soil per plant. Full-size tomato plants, cucumbers and eggplants need about 5 gallons of soil per plant.



Talking It Over

Share What You Learn

- How did you choose the plants for your container garden?
- What did you learn about container gardening that was new to you?

How did organizing information ahead of time help you in planting your garden?

Use What You Learn

How can organizing information help you make good decisions?

What are some things you can do to be more organized at home and school?

Take a Challenge

1. Make a picture story or video on planting vegetables in containers.
2. Make arrangements for a gardening expert to visit with your group.

Outdoor Gardens

An outdoor garden is a fun way to learn more about plants. You can grow all kinds of flowers, vegetables and herbs in an outdoor garden. But take some time to plan before you start digging. Designing your garden space, choosing a location, organizing tools, and getting the soil ready for planting are important first steps in outdoor gardening.

Life Skill:
Planning and organizing

Project Skill:
Planning an outdoor garden

What to Do:
Design a garden plan and prepare the site

Let's Explore

Ask your helper or another gardener to help you plan your garden space. The design tips below will get you started. Draw your plan. Label the kind and number of plants that will be in your garden.

Then organize the tools that you will need and prepare the soil for planting.

I'LL PLANT FIVE
PETUNIAS NEXT TO
THE MARIGOLDS



My Garden Plan

Designing the Garden

- Place tall plants behind smaller plants.
- Leave enough space between rows so that you can weed and hoe.
- Space the plants so that they have room to grow.

Choosing a Site

- Choose a site that can be watered.
- Make sure there is enough light for your plants.
- Select a place where the soil drains well.

Garden Tools

- spade or shovel
- garden rake
- hoe
- trowel
- seeds or plants
- compost, manure, or peat moss and fertilizer

Getting the Soil Ready

- Remove grass, weeds or other plants growing in your garden site. Pull them out by the roots.
- Loosen at least the top 6 inches of soil. Use a spade to dig up the soil and turn it over.
- Break up big clumps of soil.
- Take out any rocks, glass, plastic or other objects that you find in the soil.
- Mix organic matter such as compost, manure or peat moss into the soil.
- Use a garden rake to smooth the soil.

THIS SOIL
NEEDS COMPOST



Talking It Over

Share What You Learn

- How did you select your garden site?
- What was the hardest part about designing your garden?

Why is it important to plan and prepare your garden before planting?

Use What You Learn

How did planning your garden help you make better decisions?

How can planning and organizing help you be more prepared?

Take a Challenge

1. Take a soil sample of your garden and add fertilizer if needed. Your Extension Service has information you can use.
2. Learn about raised gardens.

Going Hands On

Decisions are a part of everyday life. You probably make decisions about what to wear or what to eat without much thought. But some decisions are very important and you

should think about them carefully. In this section, you will make lots of choices. As you do the fun activities, pay attention to how you are making your decisions.

Food For the Table

There's nothing like the taste of fresh vegetables from your own garden. But vegetable gardens don't just happen. You have to make many decisions about your garden. You decide what to plant and how much to plant. You decide when to water and when to harvest. In this activity, you will make important decisions for your garden.

Life Skill:
Making decisions

Project Skill:
Comparing vegetable varieties

What to Do:
Select and plant vegetables

Let's Explore

First, list all the plants that you want to grow. Next, find out about all the different varieties of each plant. Seed catalogues, books and other gardeners will be helpful.

Compare the varieties and choose the ones that you will plant. Then ask your family to help you plant your garden.



Vegetable	Varieties	My Choice	Why

Planting Tips

- Make straight rows using two stakes and a string. Put one stake in the ground where you want a row to start. Put the other stake where you want the row to end. Tie the string to the stakes so that it is pulled tight. Using a hoe, make a furrow right under the string.
- Plant transplants in late afternoon or early evening instead of the hot part of the day.
- Water the garden after planting vegetables.



Talking It Over

Share What You Learn

- How did you decide what varieties to plant?
- What differences did you find among the varieties of the same plant?

What was the most important thing you learned making your gardening decisions?

Use What You Learn

Why is it important to gather information before making a decision?

How can the decision-making skills you learn in a 4-H project help you in other areas?

Take a Challenge

1. Compare the nutritional value of raw, canned and frozen vegetables.
2. Conduct a taste test with your family to compare vegetables that you grow with vegetables that you buy in stores.

Exhibiting

Showing vegetables, house plants or flowers at a horticulture show is fun and exciting. But learning what judges look for takes practice. You will want to learn how to select the best house plant, flowers or vegetables for your exhibit. This activity gives you a chance to be the judge and practice your decision-making skills.

Life Skill:
Making decisions

Project Skill:
Selecting flowers, house plants, and vegetables for a show

What to Do:
Prepare an exhibit for a horticulture show

Let's Explore

First, prepare a horticulture exhibit using one or more of the plants that you have grown. If your plants are not yet fully grown, ask friends or other gardeners if you can use their plants. Then pretend that you are a judge and compare your exhibit to the standards below. Share your reasons with family members or your helper.



Vegetables

Yes No

- | | | |
|--------------------------|--------------------------|---|
| ☐ | ☐ | Are vegetables clean? |
| ☐ | ☐ | Are vegetables similar in size, color, shape, stage of maturity and condition? |
| ☐ | ☐ | Are vegetables free of dirt, cuts, bruises and defects? |
| ☐ | ☐ | Are vegetables free of insect or disease damage? |
| ☐ | ☐ | Do vegetables show the best development for their variety—the best color, shape, condition? |

Cut Flowers

Yes No

- | | | |
|--------------------------|--------------------------|---|
| ☐ | ☐ | Are flowers and foliage similar in terms of color, shape and size? |
| ☐ | ☐ | Are flowers at a similar stage of opening? |
| ☐ | ☐ | Are flowers free of bruises and blemishes? |
| ☐ | ☐ | Are flowers the correct shape? |
| ☐ | ☐ | Have flowers been picked when they are mature and looking their best? |

House Plants

Yes No

- | | | |
|---|---|---|
| — | — | Is plant free of insect, disease and mechanical damage? |
| — | — | Does plant have the right foliage size and color? |
| — | — | Does plant have even growth all around, not just on one side? |
| — | — | Is plant in a neat, clean container? |

Exhibiting Tips

- Know the show rules.
- Find out what the requirements are for your exhibit.
- Learn what qualities judges look for in horticulture products.
- Find out about the different ways of displaying flowers and vegetables.
- Have vegetables ready at show time. Ask an adult to help you figure out the harvest date you will need.

Talking It Over

Share What You Learn

- How did you prepare your horticulture exhibit?
- What did you learn from judging your exhibit?

Why is it important to learn how to choose products for a horticulture exhibit?

Use What You Learn

How does your family make decisions about buying vegetables or flowers?

How can you use your decision-making skills when you buy things?

Take a Challenge

1. Attend a county fair or garden show. Observe how a judge makes decisions.
2. Participate in a horticulture judging contest.

Glossary

Anther: The top part of the stamen in a flower, where pollen is found in pollen sacs

Asexual Propagation: a reproduction method in which a new plant is grown from a root, bud, stem or leaf, having the characteristics of only one parent plant but being true-to-type

Bulb: a swollen or thickened food storage organ; includes true bulbs, corms, tubers, tuberous roots, and rhizomes

Clone: an organism, such as a plant, descended asexually from a single ancestor

Compost: a mixture of decayed organic matter generally used as fertilizer

Corm: a swollen underground stem similar to a bulb, but without scales

Cutting: a piece of leaf, stem, or root that can develop into a new plant

Damp: slightly wet; moist to touch

Decompose: to break down into component parts; to decay or rot

Experiment: a test done to demonstrate or illustrate that something happens

Fertilizer: anything added to the soil to make it richer and to give plants more food

Filament: the slender stalk of a stamen on which the anther is borne

Flower: part of the plant which produces seeds

Foliage: plant leaves

Fruit: the ripened ovary which contains seeds

Furrow: a long, narrow shallow trench made in the ground

Geotropism: a plant's movement in response to gravity

Germinate: to begin to grow; to sprout

Herb: a plant grown for its flavor or scent

Horticulture: the art and science of growing vegetables, fruits, flowers, and ornamental shrubs and trees

Hydrotropism: a plant's movement in response to water

Leaf: an extension of the stem of a plant that turns sunlight into food

Microbe: a minute life form

Node: the enlarged point on a stem where a leaf, bud, or other organ is attached

Nutrient: something that nourishes

Organic matter: made from things that are, or once were, alive rather than from chemicals or man-made materials

Ovary: the part of a pistil containing the ovules

Ovules: A tiny structure from which a plant seed develops after fertilization

Peat moss: partly decomposed plant life, added to soil in a dried form to hold water and supply organic matter

Petal: a separate, often brightly colored segment of a flower

Phloem: plant part that carries foods which the plant has made

Phototropism: a plant's movement in response to light

Pistil: the seed-bearing organ of a flower, including the stigma, style, and ovary

Pollen: the small dust-like male particles in a flower, produced by the anthers

Pollination: the process in which pollen is transferred from the anther of a flower to the stigma of the same or another flower

Potting soil: a special soil for potted plants that is sold in bags

Propagation: growing a new plant from a plant part such as a root, leaf, or stem

Rhizome: a rootlike stem growing under or along the ground that sends out roots from its lower surface and leaves or shoots from its upper surface

Root: the underground part of a plant that anchors the plant, absorbs water and minerals, and sometimes stores food

Root rot: a condition in which roots of a plant decay, usually from too much moisture

Seed: a protected embryonic plant with a food supply

Seed container: a storage unit where seeds of a plant are contained

Sepal: one of the usually green sections forming the calyx of a flower

Sexual propagation: the natural reproduction of plants in which a seed is formed, having characteristics of both parent plants

Stamen: the pollen-producing reproductive organ of a flower, usually consisting of a filament and an anther

Stem: the part of a plant that holds it upright, supporting flowers and leaves

Stigma: the apex of the pistil of a flower, on which pollen is deposited at pollination

Style: the slender part of a pistil, rising from the ovary and tipped by the stigma

True bulb: a flower bud wrapped in thick leaves that provide food until the plant is able to grow in the soil

Tuber: a short, thick, underground stem

Variety: a group of individual plants within a plant species with only slight differences

Vermiculite: a mineral material that will hold a great deal of water; used for starting plants and cuttings or used as a soil amendment

Resources

Belcher, Betty. (1993). *Creative Flower Arranging*. Timber Press.

Fell, D. (1990). *A Kid's First Book of Gardening*. Philadelphia, PA: Running Press.

Voigt, C.E., and J.S. Vandemark. (1995). *Vegetable Gardening in the Midwest*. Urbana, IL: University of Illinois Cooperative Extension Service Circular 1331.

National Junior Horticulture Association
1424 N. Eighth St.
Durant, OK 74701

Children's Gardening Resource Directory
AHS Education Dept.
7931 E. Boulevard Dr.
Alexandria, VA 22308

Internet Sites:

GardenNet
<http://www.olympus.net/gardens/welcome.html>

University of Illinois Horticulture Fact Sheets
<http://w3.ag.uiuc.edu/HORT/extension/factshts/fact.sheets>

The Horticultural Web
<http://www.horticulture.com>

New York Botanic Garden
<http://www.pathfinder.com/vg/Gardens/NYBG/index.html>



Exhibiting Tips

Here are general guidelines for exhibiting a horticulture project. **Check your local 4-H show book for specific exhibit requirements.**

Herbs

Select herbs that are free of blemishes, bruises, and insect and disease damage.

Fresh cut: 12 stems or branches tied into 1 bunch with stem measuring 1 inch in diameter

Potted: 1 plant per container, or a combination of 2 or more plants

Annual Flowers

Check your 4-H show book to find out about the number of stems and kind of container to use for different flowers.

Select and cut flowers in the late afternoon or early evening before the show. If cutting flowers late in the day is not possible, you can cut them the morning of the show. Cut the stems longer than needed.

Remove any leaves halfway up the stem. Immediately place the stems in a container of warm water.

House Plants

Exhibit a plant in the container in which it has been growing. Plant should be free of bruises, torn leaves, and insect and disease damage.



Vegetables

Check your show book to find out how many vegetables to exhibit and how to display them (on paper plates, in a container, etc.)

When exhibiting more than 1 specimen, select vegetables that are similar in size, shape, color, and stage of maturity. Choose vegetables that are free of dirt, cuts, bruises, defects, and insect damage. Make sure they are high quality and true to the variety.

One specimen: broccoli (head); cabbage; cauliflower; Chinese cabbage (head); eggplant; greens (collard, endive, kale, escarole, mustard, Swiss chard)—1 plant; winter squash; pumpkin; watermelon; horseradish—root; lettuce—one head or plant; muskmelon

Five specimens: asparagus spears; beets; carrots; sweet corn; kohlrabi; leek; pickling cucumber; slicing cucumber; large dry onions; parsnips; large peppers; popcorn ears; Irish red potatoes; Irish white potatoes; sweet potatoes; rhubarb stalks; turnips; summer squash; slicing tomatoes

Twelve specimens: green beans (pods); lima beans (pods); wax beans (pods); okra; green onions; set onions; peas (pods); small fruit peppers (chili, cherry, etc.); shallots; small fruit tomatoes

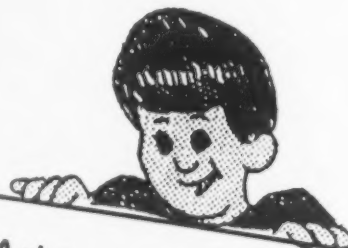


College of Agricultural, Consumer and Environmental Sciences

University of Illinois at Urbana-Champaign

Copyright 1996 by University of Illinois Board of Trustees

Authors and publishers have granted permission for copies of this work or parts of this work to be reproduced, provided that (1) copies are distributed at or below the cost of reproduction; (2) the author, the publication, and the University of Illinois College of Agricultural, Consumer and Environmental Sciences and the relevant division within the College are identified; and (3) proper notice of copyright is affixed to each copy.



Acknowledgements

Curriculum Coordinator:
Ann Rund

Extension Specialist, Youth Development
Content Specialist:
Jim Schmidt

Extension Specialist, Horticulture
Writer/Designer:
Annette Campbell

Extension Educator, Communications
Editor:
Phyllis Picklesimer

Artist:
Jerry Barrett



4-H Publication MJ0601

September 1996



Cooperative Extension Service
University of Illinois at Urbana-Champaign

In furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, D.R. Campion, Interim Director, Cooperative Extension Service, University of Illinois at Urbana-Champaign. The Illinois Cooperative Extension Service provides equal opportunities in programs and employment.



4-H Horticulture Unit 2

Branching Out



Project Activity Guide

Name _____ Age _____ County _____

Contents

Note to the Project Helper	3
Horticulture Fun.....	4
Plans and Highlights	5
My Horticulture Achievements: Unit 2	6

Fun With Learning

Life Skill: Learning to Learn

What You Know	8
Finding Answers	10
Air Layering	12
No Soil? No Problem	14

Growing On

Life Skill: Planning and Organizing

Plant a Terrarium	16
Compost Magic	18
Growing Transplants	20
Testing Your Soil.....	22

Decisions, Decisions

Life Skill: Making Decisions

Taking the Work Out of Gardening	24
Gorgeous Flowers	26
Pesky Pests.....	28

Time to Shine

Life Skill: Communicating With Others

Plant Records.....	30
Flower Arranging	32
You're the Judge	34
Glossary	36
Resources	37
Exhibiting Tips	38

Note to the Project Helper

Welcome to the 4-H horticulture project. As a project helper, you have an important role in guiding, supporting, and encouraging youth. This project guide is designed to help youth actively explore the world of horticulture. It includes hands-on horticulture activities for both indoor and outdoor fun.

Horticulture Project Guides

The three 4-H horticulture project guides are designed for beginning, intermediate and advanced learners. In each lesson, you will find a learning activity that emphasizes a project skill and a life skill. This Level 2 project focuses on four life skills: learning to learn, communicating with others, planning and organizing, and making decisions.

Each project guide includes *Let's Explore* activities designed to help youth learn by doing. The *Talking It Over* sections help youth process what they have learned as they discuss the experience with you. Keep in mind that most of the questions in this section will not have a right or wrong answer. Your goal is to help youth clarify and expand on their own ideas. *Take a Challenge* sections provide additional learning activities for youth to explore. Encourage youth to enhance their project experience with these challenging activities. Each project guide also includes an achievement program to recognize youth for their accomplishments.

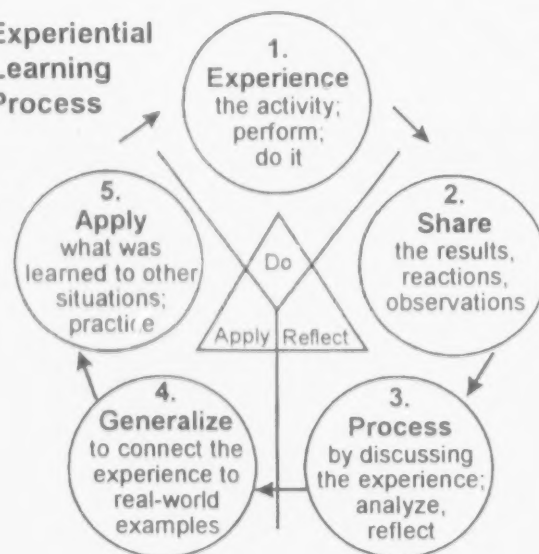
Leader's Guide

The 4-H horticulture series also includes a Leader's Guide. This publication provides more specific content information as well as fun learning activities for groups. These group activities are suitable for families, classrooms, 4-H project groups, or other clubs and groups. You will also find information about the experiential learning model and how to use it to promote life skill development.

4-H: Experiential Learning

This learning method—doing an activity, reflecting on the experience, and applying the new knowledge—is called the **Experiential Learning Model**. This model is what makes 4-H youth development education different from other formal education methods. Each lesson in the 4-H horticulture series uses experiential learning to help youth get the most out of their learning experiences.

Experiential Learning Process



As you can see from the diagram above, youth start by completing an activity on their own. Then, you meet together to talk about the experience. With your guidance, youth reflect on what they did and how they can apply the learning to other situations. This method may seem different at first, but with your efforts young people will soon become comfortable with the process and learning will go well beyond horticulture. Good luck!

Horticulture Fun

Welcome to 4-H horticulture! In this Level 2 project, you will explore new ways to grow plants both indoors and outdoors. You'll have fun learning about hydroponics, air-layering, transplanting, and flower arranging. You'll also learn about controlling pests, testing soil, and using mulches. And you'll have fun working with friends and expanding your gardening interests. All kinds of exciting opportunities await you in the 4-H horticulture project. Set high goals for yourself and see just how far you can go.



Horticulture 2 Project Guidelines

- Do at least four required activities and three challenge activities each year.
- Complete Level 2 within three years.
- Participate in at least three of the learning experiences listed on page 5 each year.
- Record project goals and accomplishments.
- Practice the life skills emphasized in this unit: learning to learn, planning and organizing, making decisions, and communicating.

Horticulture Activity Guide

The activities in this guide will give you new challenges to explore. Work with your project helper to complete each activity. Remember, this guide is not designed to provide you with answers to all of your questions. Learn to find and use resources such as gardening books, videos, Extension Service educators, other gardeners, and horticulture professionals.

Record your goals and work in this guide. A written record will be useful as you progress through Level 2. It will also reflect all that you have learned and accomplished in the project.

Your Project Helper

As you have probably learned from Level 1, a project helper is a great resource. Choose someone who will support your efforts to complete the horticulture achievement program. Your helper will meet with you to set goals, suggest resources to use, and give feedback as you complete each activity. Write the name and phone number of your project helper below.

Project Helper: _____

Phone: _____

Plans and Highlights

Horticulture Project Goals

Name _____

Goals for the Level 2 horticulture project:

Year _____

Year _____

Year _____

Horticulture Highlights

Date and list important things you do and learn.

Major Learning Experiences

Date any of these things that you do.

Year	Year	Year	Activity
			Give a presentation
			Attend a horticulture show
			Attend a horticulture clinic
			Participate in a horticulture judging contest
			Recruit a project member
			Help organize a horticulture activity for your group
			Exhibit at a fair
			Help another project member

My Horticulture Achievements: Unit 2

Directions:

1. Do at least four required activities and three challenge activities each year.
2. Finish at least 20 activities in three years to complete this level.
3. Date each activity when you complete it and have your project helper initial it.

Required: Complete at least three of the four activities in the section, *Fun with Learning*.

Helper	Date	Activity
		What You Know
		Finding Answers
		Air Layering
		No Soil? No Problem!

Options: Complete any of the challenges on pages 8 to 15, or write your own challenge.

		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Write your own challenge here:

Required: Complete at least three of the four activities in the section, *Growing On*.

Helper	Date	Activity
		Plant a Terrarium
		Compost Magic
		Growing Transplants
		Testing Your Soil

Options: Complete any of the challenges on pages 16 to 23, or write your own challenge.

		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Write your own challenge here:

Required: Complete at least two of the three activities in the section, *Decisions, Decisions*.

Helper	Date	Activity
		Taking Work Out of Gardening
		Gorgeous Flowers
		Pesky Pests

Required: Complete at least two of the three activities in the section, *Time to Shine*.

Helper	Date	Activity
		Plant Records
		Flower Arranging
		You're the Judge

Options: Complete any of the challenges on pages 24 to 29, or write your own challenge.

		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Write your own challenge here:

Options: Complete any of the challenges on pages 30 to 35, or write your own challenge.

		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Write your own challenge here:

I certify that _____ has completed the Level 2 horticulture project.

Project Helper's Signature _____ Date _____

Fun with Learning

Learning is fun when you do it in creative ways. Puzzles, games, experiments and hands-on projects are just some of the ways that you learn new things. How do you like to learn best?

In this section you will experience lots of different ways to learn. After completing the activities, share with your helper the best ways for you to learn.

What You Know

As a gardener, you will want to know some common terms that relate to growing plants. Knowing how to use the proper words helps you in talking with other gardeners. This activity will help you learn new plant terms and review those that you already know.

Life Skill:
Learning to learn

Project Skill:
Reviewing horticulture terms

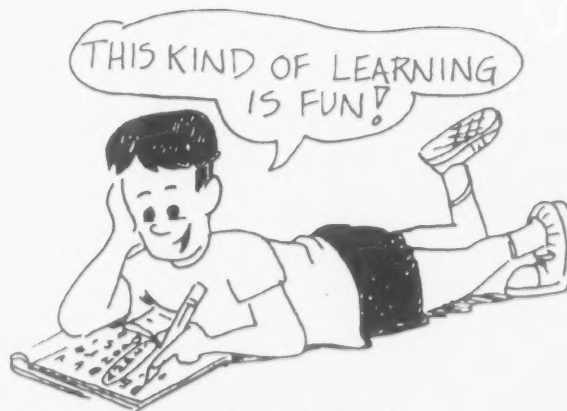
What to Do:
Complete the word search and crossword puzzle

Let's Explore

Complete the word search and crossword puzzle. Write down any terms that you don't understand and find out their meaning.

PLANT TERM SEARCH

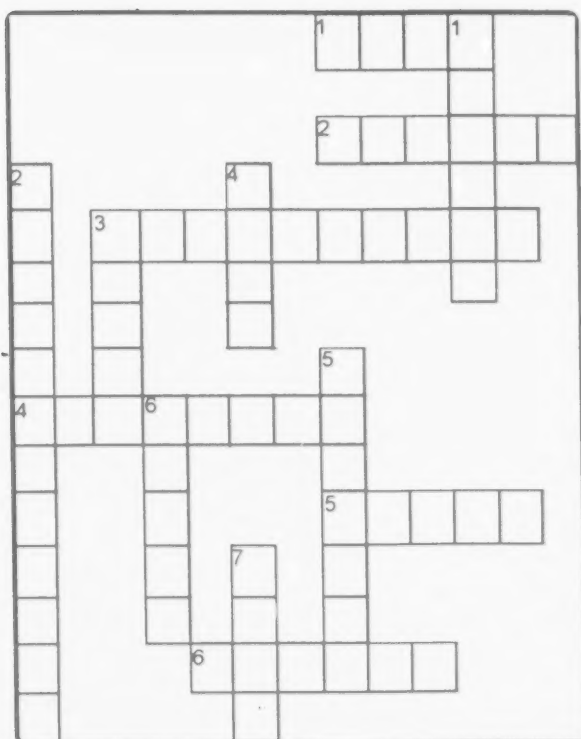
P S O H Y D R O T R O P I S M
H D E C O M P O S E R O V M S
O R G A N I C O S E Q L U K V
T W L P Y Z N T D E C L B A E
O D S G E R M I N A T I O N R
S B Z Y X W I I Y S T N M Z M
Y M V M W T C L M O E A K A I
N K C A D Y R Z X C B T L C C
T L V S R P O N W O L I S V U
H S F X U I B X U M K O A F L
E Z D V Y Z E D R P L N N B I
S X S O W P S T T O F P V E T
I A X P Y R U W Y S E L B N E
S K P R O P A G A T I O N B T



Word Bank

Compost
Hydrotropism
Propagation
Pollination
Vermiculite
Photosynthesis

Germination
Microbes
Clone
Variety
Organic
Decompose



Crossword Puzzle

Across

1. The plant part that turns sunlight into food
2. The plant part that carries food which the plant has made
3. Anything added to soil to make it richer and to give plants more food
4. Pieces of leaf, stem or root that can develop into a new plant
5. The plant part which carries water and mineral salts to all parts of the plant
6. The small dust-like male particles in a flower

Down

1. The plant part which produces seeds
2. The art and science of growing vegetables, fruits, flowers, shrubs and trees
3. The ripened ovary which contains seeds
4. The part of the plant that holds it upright
5. The type of propagation in which a new plant is grown from a root, stem or leaf
6. A short, thick underground stem
7. The plant part that absorbs minerals and water and sometimes stores food

Talking It Over

Share What You Learn

- What terms were new to you?
- How did you find answers to the things you didn't know?

Why is it important to know plant terms?

Take a Challenge

1. Design a game or quiz that will test basic plant knowledge. Try it with your family or group.

Use What You Learn

What kinds of learning activities help you remember things best?

Why is it important to know how you learn best?

Finding Answers

How much light do my plants need? Should I feed my plants? How many plants can I grow in one container? These are just some of the questions that gardeners ask when they start new plants. Experiments are a good way to learn about what plants need. A simple experiment would be to place two of the same kind of plant in different locations and then compare how they grow. Experiment results give you important information about your plants.

Life Skill:
Learning to learn

Project Skill:
Learning about plant needs

What to Do:
Conduct an experiment to learn about plant needs

In this activity, you will put your observation skills to work as you conduct your own plant experiment.

Let's Explore

Conduct an experiment to see how plants are affected by soil, light, water, fertilizer or crowding. Use the problem-solving steps in *The Science Scene* to help you design your experiment. Then share the results of your experiment with your helper or group.

Indoor Plant Experiments

- Using two plants of the same kind, plant one in a pot of garden soil and the other in potting mix.
- Using three plants of the same kind, water one as you normally would, water the second plant half as much as normal, and water the third plant twice as much as normal.
- Using two plants of the same kind, fertilize one but not the other.
- Plant radish seeds in three different 6-inch pots. Plant two seeds in the first pot, six seeds in the second pot and 18 in the third container.

My Plant Experiment

My question: _____

My prediction: _____

What I did: _____

Conclusions: _____

Talking It Over

Share What You Learn

- Explain what you did in your experiment.
- What were the results of your experiment?

What conclusions did you make?

Use What You Learn

Why is it important to know how to conduct an experiment in order to compare things?

What other things could you compare by conducting an experiment?

The Science Scene

Scientists use all kinds of experiments to find answers to the questions they have. An experiment has something that stays the same, called a control, and something that is changed, called a variable. A good way to design an experiment is to use these problem-solving steps.

1. Ask a "what if" question.
2. Predict what you think will happen.
3. Design the experiment:
 - List the steps you will take to find the answer.
 - Change only one thing (the variable) and keep everything else the same.
 - Have a control—that is, treat one thing as you normally would.
 - Repeat the experiment to see if the same thing happens again.
4. Write down your observations.
5. Decide what you learned and make conclusions about why the experiment turned out the way it did.



Take a Challenge

1. Design an experiment that compares the growth of two different varieties of the same plant.
2. Plant the same number and kind of seeds in different size pots. Compare the results.

Air Layering

Propagating new plants is one of the fun parts of both indoor and outdoor gardening. You've probably had the experience of starting a plant from a stem, root or leaf. Air layering is another way to get new plants started from old plants. In air layering, the idea is to get a stem to develop new roots while the stem is still attached to the parent plant. This activity gives you a chance to learn more about plant propagation by trying the air layering method.

Life Skill:
Learning to learn

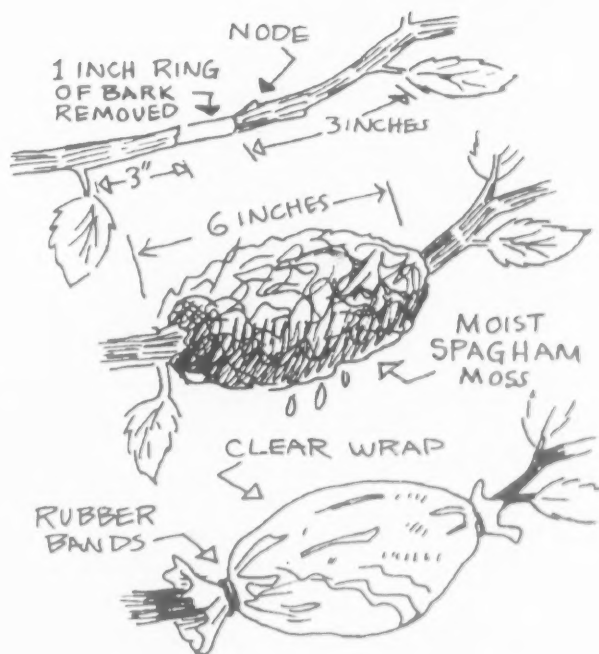
Project Skill:
Learning about plant propagation

What to Do:
Start a new plant using air layering

Let's Explore

You need: a healthy plant, sharp knife, rooting hormone, sphagnum peat moss, clear plastic wrap, rubber bands.

1. On a healthy stem, choose an area just below a node and remove the leaves or branches 3 inches above and below this point.
2. Cut a 1-inch ring from the bark of the stem. To do this, make a shallow cut completely encircling the stem and another cut 1 inch above or below this point. Remove the bark between the two cuts so that the cambium layer, a greenish layer beneath the bark, is completely removed.
3. Dust rooting hormone into the wound.
4. Cover the wound with a handful or two of moist sphagnum moss, forming a football shape about 4 inches long and 4 inches wide.
5. Wrap the clear plastic material around the moss, leaving no openings that would allow evaporation. Hold the plastic in place with rubber bands, both above and below the moss ball.



6. Water and care for the plant as you normally would.
7. When you see roots through the moss, remove the plastic film and cut off the new plant just below the roots.
8. Pot the new plant in potting mix.

Talking It Over

Share What You Learn

- What did you learn from the air layering activity?
- What other methods of plant propagation have you used?

How do you know which propagation method is best for a certain plant?

Use What You Learn

Why is it important to learn how to start new plants from old plants?

What other times could you make something new from something old?

The Science Scene

Layering is an asexual propagation process, so new plants are a clone of the parent plant. This means they have the same flower, fruit and foliage characteristics of the parent plant. There are several types of layering, but air layering and simple layering are the most common methods.

Simple layering is common in nature when flexible branches touch the soil and take root. The raspberry plant is a good example of simple layering.

Air layering, on the other hand, brings the rooting medium to the stem while it is in its original upright position. Air layering is a good propagation method for house plants such as the croton, Chinese evergreen, philodendron, fiddleleaf fig, oleander, camellia and rubber plant.



Take a Challenge

1. Start a new plant using the simple layering method.
2. Conduct an experiment comparing two layering methods on the same plant.
3. Make a list of the plants you like to grow and find out the best propagation method for each plant.

No Soil? No Problem!

You know that plants get the nutrients they need from soil. But what if you don't have any soil? Can you still grow plants? You can if you know about hydroponics. Hydroponics is the practice of growing plants without soil. In hydroponics, plants get their food from a nutrient solution instead of the soil. In this activity, you will learn some basics about hydroponics by growing a plant without soil. Tomato and marigold plants are easy to grow hydroponically.

Life Skill:
Learning to learn

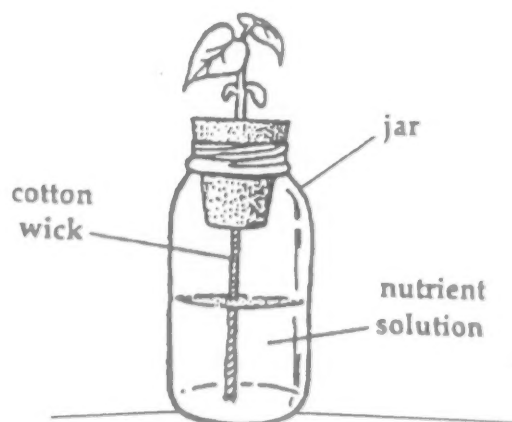
Project Skill:
Exploring hydroponics

What to Do:
Grow a plant without soil

Let's Explore

You need: plant seedling; small pot; glass jar; cotton wick; small rocks, gravel, glass marbles or perlite; and nutrient solution. You can buy a nutrient solution or make your own. The nutrient ingredients should be available at drugstores.

1. Pour the nutrient solution into a glass jar, filling about half the jar.
2. Untwist one end of the wick to make it fan out.
3. Pull the other end of the wick through the drain hole in the flower pot, leaving the fanned-out end in the bottom of the pot.
4. Suspend the pot in the glass jar so that the rim of the glass jar supports the pot and the end of the wick hangs in the solution.
5. Set seedling in the pot and surround the roots with small rocks or gravel. This is how the plant is supported.
6. Set your hydroponic system in a warm location that will get at least 8 hours of light. Observe the plant growth.



Hydroponic Nutrient Solution

Add these ingredients to
6 gallons of water:

- $\frac{1}{4}$ tsp. potassium phosphate (KH_2PO_4)
- 1 tsp. potassium nitrate (KNO_3)
- $1\frac{3}{4}$ tsp. calcium nitrate (CaNO_3)
- 1 tsp. magnesium sulfate (MgSO_4)

Talking It Over

Share What You Learn

- How well did your plant grow in the hydroponic solution?
- What did you learn about hydroponics?
- How does the growth of hydroponic plants compare to soil-grown plants?

Use What You Learn

Hydroponics is an alternative to growing plants in soil. Why is it important to learn about alternative ways of doing things?

In what other situations would it be important to explore different alternatives?

The Science Scene

Hydroponically grown plants have the same basic needs as soil-grown plants. They need an adequate temperature and plenty of light, water, oxygen and mineral nutrients. The essential nutrients that plants need are phosphorus, potassium, nitrogen, calcium, magnesium and sulfur. Plants usually get nutrients from the soil. But plants grown in hydroponic systems rely on a nutrient solution for their food needs. When plants are grown hydroponically, their roots are either immersed in or coated by a carefully controlled nutrient solution. The water and nutrients do the work of soil.

Take a Challenge

1. Compare the same plant grown in soil and grown hydroponically. Share your results with your helper.
2. Vary the amount of nutrients in a hydroponic system and look for nutrient deficiencies in the plant.
3. Find out about a type of hydroponics called aeroponics. Try to grow a plant using an aeroponic system.
4. Find examples in nature where plants are growing without soil.

Growing On

You can probably remember lots of times when you have helped to plan something like a party or a family trip. Planning for something new can be exciting and fun.

A good plan can also help you succeed. It's a chance to think things through before taking action. The activities in this section will help you practice your planning skills.

Plant a Terrarium

How many times have you tried out something at the store before buying it? Maybe you've turned on a radio or tried a new electronic game that was displayed on a store shelf. A terrarium is one way for you to try out gardening. A terrarium is a small garden in a covered glass container. In this activity, you will practice your planning skills as you make a terrarium.

Life Skill:
Planning and organizing

Project Skill:
Selecting plants for a terrarium

What to Do:
Plant a terrarium

Let's Explore

Begin by making a list of plants that would grow well in a terrarium. Ask for advice from your helper or other gardeners. Then gather the things that you need and try out different plant arrangements in the empty container. When you get an arrangement that you like, plant your terrarium.

You need: clear glass container, a lid or clear plastic wrap, potting soil, gravel, crushed charcoal (specifically for plants), moss, plants, spoon.

1. Wash the container and its lid.
2. Line the lower quarter of the container with moss. Put the green side next to the glass to hide the soil.
3. Place a few pieces of charcoal and a 1-inch layer of gravel on top of the moss.



4. Add soil until it is slightly higher than the moss and scoop out holes for the plants.
5. Set the plants in the holes, mist the soil lightly with water, and press soil gently around the roots.
6. Lightly mist and press the soil three or four times daily during the first three days. Leave the lid off for the first three days.
7. Put the cover on your terrarium and place it in bright light, but not direct sunlight.

Talking It Over

Share What You Learn

- What plants did you choose for your terrarium?
- What was the hardest part about planting your terrarium?

How did organizing the plants in an empty container help you decide where to place the plants in your terrarium?



The Science Scene

How does a terrarium work? The glass walls allow light to reach the plants and protect the plants from dust, drafts and temperature changes. The plants get water from the humidity in the container. Plants give off water from their leaves in the form of a water vapor. When air in the container comes in contact with the cooler glass walls, the water vapor becomes liquid and soaks into the soil on the bottom. The plants take in this water through their roots, so the water can be used again and again.

Use What You Learn

Why is it helpful to plan ahead before starting a project?

How does planning and organizing make a hard project easier to manage?

Terrarium Tips

- Choose plants such as ferns, ivy and lichens that live in high humidity.
- Place the terrarium in bright light, but not direct sunlight.
- Keep the terrarium covered.
- Water the terrarium only if the soil seems dry.
- Rotate the terrarium so that the plants grow straight.
- If water runs down the sides of the container, the terrarium is too wet. Remove the lid until the sides dry.

Take a Challenge

1. Organize a tour of a greenhouse for your group.

Compost Magic

You already know that compost is a rich fertilizer made from garden and household leftovers that decay. But have you ever thought about just how it all works? Composting is almost like magic. But the magicians are not people; they are tiny microbes such as fungi and bacteria. These microbes do all the work, breaking down all the dead plant and animal material. We just give these microbes the things they need to do their work.

Life Skill:
Planning and organizing

Project Skill:
Discovering how
composting works

What to Do:
Build a compost pile

In this activity, you will build a compost pile and discover how to help the microbes do their job.

Let's Explore

Start by planning where you will put your compost pile. Some people build their compost pile near a garden while others like it closer to the house for convenience. Talk to family members to help you decide the best place for your compost pile. Next decide when you want to start your

compost pile. It can take 6 to 12 months before compost is ready to use. So if you want to have compost for a spring garden, you will need to plan ahead and build it in the fall. Your helper can show you how to build a compost pile, or you can use the tips below to help you get started.

Building a Compost Pile

1. Make an enclosure for the compost. This can be a wired-together tube of fencing; a wooden box without a top or bottom; or even a trash can with holes punched in the bottom and sides.
2. Start with a layer of fresh kitchen or garden leftovers such as leaves, grass clippings, egg shells, and vegetable and fruit peelings. Don't use meat, fish and greasy scraps.
3. Top this layer with dry materials such as hay, straw, small branches, dried leaves or dry pine needles.
4. Alternate layers of fresh and dried materials, adding soil every few layers.
5. Water the compost pile to keep it moist, but not soggy.
6. Every week or two, turn over all the materials with a spading fork. This brings the coarse materials from the edge into the center where they will decay faster.
7. The compost is ready when the ingredients have lost their identity in the brown, crumbly, decayed material.

Talking It Over

Share What You Learn

- How did you decide where and when to build your compost pile?
- How do you plan to use the compost?
- What did you learn about composting?

The Science Scene

Composting is a natural process. We just give microbes, like fungi and bacteria, what they need to do the work. These microbes that live in the soil need four things: (1) an energy source for carbon, (2) a protein source for nitrogen, (3) air and (4) water. Microbes get carbon from dry materials like dried leaves and pine needles, hay, straw and small branches. Nitrogen comes from fresh materials like grass clippings, shrub trimmings and weeds. Air is added to the pile when you turn and mix the materials. Water, of course, comes from the clouds or from you. As microbes break down the organic matter, heat is produced and nutrients are released to form rich fertilizer. All you have to do is give the microbes a good home that includes fresh matter, dry matter, air and water.

Use What You Learn

Making compost is a type of recycling. How does composting help the solid waste problem in your community?

What other things could you do to help reduce waste in your community?



Take a Challenge

1. Organize a list of compost materials, classifying them as either fresh or dry.
2. Conduct an experiment to find out how conditions such as temperature and water affect decomposition.

Growing Transplants

If you are planning to have an outdoor garden, you can get an early start by growing your own transplants from seeds. Herbs, flowers and vegetables can be started indoors and then transplanted in outdoor containers or gardens. Planning is the key to growing transplants. You need to decide what plants you want to start indoors. You also need to figure out a planting date based on when you plan to move the plants outside. In this activity, you will put your planning and organizing skills to work as you start plants for an outdoor garden.

Life Skill:
Planning and organizing

Project Skill:
Growing transplants

What to Do:
Select plants, determine planting dates, and grow transplants for outdoor use

Let's Explore

Begin by selecting two or more plants to start indoors. Some plants that are easy to transplant include tomatoes, peppers, cabbage, broccoli, marigolds, cosmos, basil and parsley. Next, figure out when the seeds should be planted so that the growing plants can be moved outside at the best time. When your plans are made, complete the activity by growing two or more transplants.



Plant	Days Needed for Germination	Weeks Needed for Growing	Date to Start Plant	Date to Transplant

Talking It Over

Share What You Learn

- How did you decide what plants to grow and what date to start them?
- What are the advantages of growing your own transplants?
- Why is planning important in gardening?

Use What You Learn

What other kinds of plans do you make?

How can you become a better planner?

Take a Challenge

1. Talk with gardeners about growing transplants. Make a chart listing plants to try and when they should be started.
2. Organize a tour of a commercial vegetable farm for your group.

THESE ARE SOME
GOOD PLANTING
TIPS



Planting Tips

- Fill the seeding container almost full with moist planting mix.
- Sprinkle the seeds on top and cover with planting mix. Read the instructions on the seed package to find out how deep to plant the seeds.
- Write the plant name and planting date on a label. Put the label on the container.
- Moisten the planting mix with water, but don't make it soggy.
- Cover the container with a piece of plastic or a plastic bag. Close the plastic with a twist tie. This holds in moisture and keeps the seeds from drying out.
- Keep the container in a warm place, about 70 degrees, but not in direct sun.
- If large drops of water appear on the plastic, take the plastic off for a few hours to let it dry out. Then replace it.
- When the first set of leaves appear, take off the plastic and water the plants as needed. The soil should be damp, but not soggy. Feed the plants with a soluble house plant fertilizer every two weeks.
- When four leaves are formed, move the planting container to a partly shaded outdoor place during the day and bring the container indoors at night.
- In two weeks, transplant the seedlings in your garden or outdoor container.

Testing Your Soil

Every outdoor garden plan should include soil sampling. A soil test gives you important information about the nutrients in your garden. You can use the results of a soil test to decide whether your garden needs fertilizer. Soil samples can be taken any time, but late summer or fall are ideal times. You can then use the results of your tests to plan your garden for the following year.

Life Skill:

Planning and organizing

Project Skill:

Learning about soil testing

What to Do:

Take a soil sample and have it tested

Let's Explore

First, gather information about soil testing. Find out how many samples to take, where the samples are tested, and what the costs are for the tests. Your Extension Service is a good place to start.

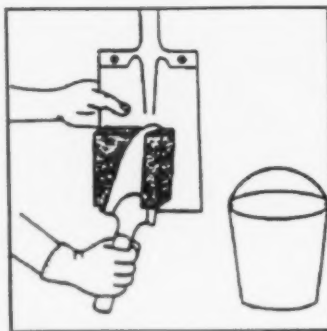
Then take a soil sample from your garden site. Ask your helper, parent or Extension professional to help you understand the test results. Use the results to plan your flower, herb or vegetable garden.

Taking a Soil Sample

1. Use a spade or trowel to remove a slice of soil about 6 inches deep.

2. Put a 1-inch section of this slice in a bucket. Take out any leaves, sticks, rocks or other objects.

3. Repeat this sampling in other random locations in your garden. Get about 8 samples in a 100-square-foot garden.



4. Mix the samples together in the bucket.

5. Remove about a cup of the mixed soil and lay it on newspaper to dry at room temperature.

6. Put this dried soil in a plastic bag. Label the sample with your name, address, what was grown in the site last year, and what you want to grow now.

7. Send the sample to your nearest soil testing lab.

Talking It Over

Share What You Learn

- How did you find the information you needed to get your soil tested?
- What did you learn from your soil test?

What things, if any, need to be added to your garden?

Use What You Learn

How does soil sampling help you make plans for your garden?

What other things in your life could be improved with planning?

The Science Scene

A soil test gives you important facts that you can use to improve the soil in your garden. A soil test tells you the pH, or acidity, of your soil. Many plants grow best in soil that is slightly acidic to neutral—a pH of 6.1 to 7. For example, vegetables grown under high-acid soil conditions usually have poor yields, so it is important to maintain a proper pH level. Other plants may need different pH levels. Limestone is used to raise soil pH, and sulfur is used to lower pH. A soil test also tells you what kinds of nutrients and minerals are in your soil. Your garden may need more phosphorus, potash or micro-nutrients to help plants grow. A soil test is a good way to help you decide what kind of fertilizers are needed and when they should be applied to your garden.



Take a Challenge

1. Give a presentation to your group on how to take a soil sample.
2. Organize a tour of a soil testing laboratory for your group.

Decisions, Decisions

Learning how to make good decisions is something everyone must do. Getting the facts, thinking about what you could do, and then deciding what action to take are all part of

the decision-making process. The activities in this section will give you some hands-on gardening experience as you practice your decision-making skills.

Taking the Work Out of Gardening

Have you ever started a new project, only to find it involved more work than you really wanted to do? Planting flowers, herbs or vegetables in the spring is exciting and fun, but keeping the weeds out soon becomes a dreaded task. You can take some of the work out of gardening by using mulches. Mulching means that you cover the soil around plants with natural or synthetic materials.

Life Skill:
Making decisions

Project Skill:
Using mulches

What to Do:
Select mulch and apply around plants

In this activity, you will explore the benefits of mulches and decide what kind of mulch would work best for you.

Let's Explore

Begin by gathering information about different kinds of mulches. Gardening books, other growers and your Extension Service are good information sources.

Next, use the decision chart below to help you decide what kind of mulch to use on your plants. Then apply mulch to your flower, herb or vegetable garden.

Mulching Decisions		
Kind of Mulch	Advantages	Disadvantages

Talking It Over

Share What You Learn

- How did you gather the facts you needed?
- What kind of mulch did you decide to use?

What were the most important considerations in making your decision?

Use What You Learn

How does comparing advantages and disadvantages help you make decisions?

How can you use comparisons to make informed decisions in the future?

Organic or Synthetic?

Organic mulches include peat; animal manures; plant leftovers such as hay, straw, grass clippings, leaves, peanut hulls and compost; and wood byproducts such as sawdust, wood chips and shavings.

Organic mulches improve the soil as they decompose, putting organic matter and nutrients back into the soil. Organic mulches usually keep the soil cool, so they should be put on the soil after plants are well established. Apply organic mulch evenly over the soil between the rows and around plants.

Synthetic mulches, such as black plastic film, help warm the soil. This warming effect speeds up seed germination and benefits heat-loving plants. Lay synthetic mulches on moist soil before planting begins. Cut holes in the plastic for plants and cut slits for seeds. Clear plastic should not be used since it allows weeds to grow beneath it.

The Science Scene

How do mulches help plants? Plants usually grow better when mulched because a healthy root system develops under the protective mulch. Since you don't have to hoe or cultivate around mulched plants, their roots are protected from injury. Mulches also conserve moisture in the soil, keep the soil temperature more uniform, and keep weeds from competing with the plants for food and water.

Take a Challenge

1. Conduct an experiment to compare plants grown with and without mulch.
2. Give a presentation to your group or family about the benefits of mulching.

Gorgeous Flowers

You have probably heard of the terms annuals and perennials. But do you know the difference in these two kinds of flowers? An annual is a plant that completes its life cycle in one season. It grows from seed in the spring, flowers, produces seed and then dies. A perennial is a plant that dies to the ground each winter and then starts growing again the following spring.

Life Skill:
Making decisions

Project Skill:
Flower gardening

What to Do:
Select and plant flowers

In this activity, you will put your decision-making skills to work as you select and grow flowers.

Let's Explore

First, decide where you want to grow flowers. You might want to plant them as a border, use them in a garden or grow them in containers for a patio, porch or balcony. Next, select the plants that you want to grow. Do you want annuals, perennials, or some of both? Consider the space they need, how much light they need, and the kind of climate they need. This information will be on seed packets and on bedding plants. Match your space, light and climate with the needs of the plants you want to grow. Also think about the shape, height and color of the plants you choose. After you have made decisions about what to grow, ask your helper or parent to help you plant your flowers.

Selecting Shapes and Textures

Each flower has a general shape falling somewhere between vertical or columnar and horizontal or spreading. Flowers also have different textures. Texture refers to the appearance of a leafy plant, not the feel of it. Flowers are grouped as coarse-, medium- or fine-textured. Using various shapes and textures in a garden creates an interesting effect.

Selecting Heights

Flowers vary in height from a few inches to several feet tall. A good way to arrange heights is to put tall plants in the back, medium plants in the middle and shorter plants in the front.

Selecting Color

Color is an important consideration in a flower garden. Warm, bright colors, such as red, orange and yellow, stand out in a landscape. They are best used for accent or for viewing from a distance. Cool colors, such as blue, green and purple, tend to recede in the landscape. They are good for close viewing and are pretty in masses. A monochromatic scheme uses flowers that have various shades of a single color, such as red or blue. A complementary scheme uses colors that are opposite each other on the color wheel, such as yellow/violet, red/green, or orange/blue.

Talking It Over

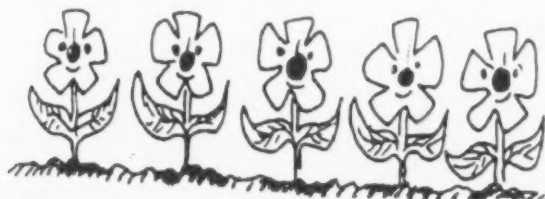
Share What You Learn

- What kind of garden did you plant?
- What were the most important things you learned about annuals and perennials?
- What kinds of decisions did you make in planning and planting your garden?

Use What You Learn

How does an understanding of color, shape, texture and design help you make good decisions about flower gardening?

How can you use computer technology to help you make good decisions?



Designing With Flowers

Designing a flower garden and watching it grow before your eyes is exciting. But before you start digging, carefully plan your garden. This will help you avoid common mistakes such as too many different sizes, shapes, colors or textures. Beautiful gardens have strong lines and structure and a sense of order. Use these tips to help you get started:

- Decide what kind of display you want. Do you want to make a border for a sidewalk, driveway or lawn? Or how about an island bed that sits in a large lawn area? A container display is another option for a porch, deck, patio or balcony.
- Use flowers to guide the eye to a focal point such as a front door.
- Use large flowering plants to hide garbage cans and compost piles.

Planting Tips

- Plant seeds or transplants in late afternoon or on a cloudy day. This helps them recover from transplant shock before getting the hot sun.
- Plant flowers in groups of at least three to five plants. A single plant will get lost in the overall garden.
- Choose a sunny location. Most flowers grow best in full or partial sun.

Take a Challenge

1. Use the annuals that you grow to design a floral arrangement.
2. Start annuals from seeds indoors. Transplant young plants outdoors after the danger of frost is past.

Pesky Pests

Just like people, plants get sick. Many times, insects or other pests are the problem. Pests can reduce yields in vegetables and herbs. Pests can also hinder normal growth in house plants and flowers. As a gardener, you need to be able to identify potential problems so that you can properly care for your plants. This activity will give you some practice in deciding whether your plants have a pest problem.

Life Skill:
Making decisions

Project Skill:
Identifying plant pest damage

What to Do:
Examine plants for insect damage

Let's Explore

Some common pests that attack outdoor plants are listed below. Use resources such as your Extension Service, library

and helper to research each of these problems. Find out the best treatments or way to prevent each of these pest problems. Then examine at least three plants for symptoms of these pests.



Pest

Cutworm



Description

Black, gray, or mottled caterpillar, about 1 inch long.

Symptoms

Cut-off or wilted plants. Holes chewed through stems at or just under soil surface.

Aphids or plant lice



Tiny, soft-bodied insect, usually wingless. Color ranges from pale green to black. Slow moving.

Curled leaves. Presence of honeydew, a clear, sticky substance on leaves and fruit given off by aphids; plant turns black from mold growth.

Slugs



Shiny, slimy, soft, legless creature, up to 2 inches long.

Paths of slugs marked by shiny mucous trails. Holes chewed in leaves. Fruit scarred.

Leafhoppers



Green, wedge-shaped pest, under an inch long.

Curled or crinkled foliage. Brown edges on leaves indicate hopper burn.

Plant Name
Symptoms
Pest Causing Damage
Treatment

Plant Name
Symptoms
Pest Causing Damage
Treatment

Plant Name
Symptoms
Pest Causing Damage
Treatment

Talking It Over

Share What You Learn

- What did you learn about each of the pest problems you researched?
- What resources did you use?

What are some things you can do to keep plant pest problems under control?

Take a Challenge

1. Learn about bacterial and fungal diseases that occur in plants. Write a brief summary of your findings.

Use What You Learn

What are some ways you could research human diseases and illnesses?

How can information about human illnesses help you make wise decisions?

Time to Shine

Good communication skills are important in life. You've probably had to give an oral report or read in front of a group at school. Were you a little nervous about it?

Communicating with others gets easier with experience. The activities in this section will give you a chance to practice different types of communication.

Plant Records

Whether you raise a garden of vegetables or house plants on a windowsill, you will want to keep track of certain things on paper. Records will tell you if your plants are growing well, getting bigger or needing to be moved to a new home. The better records you keep, the better you will know how to care for your plants. Records also help you tell others about your successes in horticulture.

Life Skill:

Communicating with others

Project Skill:

Keeping records

What to Do:

Keep two different kinds of records for your plants

Let's Explore

Select two types of plant records from the list below. Using a notebook or sheets of paper, record your progress. Then use your records to write a horticulture success story. Share your story with your family, friends, or group.

Journal: Write what you like about growing plants, what is happening to your plants, and ideas for future projects.

Yield: List the horticulture products you produce, in pounds or number of items.

Planting Schedule: Record the date, variety, and estimated date of maturity for each plant that you grow.

Experiments: Keep a summary of the plant experiments that you conduct.

Income and Expense Statement:

Make a list of income from horticulture products that you sold or the value of those products that you give away. Then list all expenses such as seed, fertilizer, pest treatments, supplies and equipment.

Portfolio: Make a folder of horticulture information. This might include several types of records, photographs and notes from your activities.

Talking It Over

Share What You Learn

- What kinds of records did you keep?
- How did you feel about keeping records?
- Why is it important to keep records of your plant projects?

How did keeping records help you tell others about your experiences?



Plant	Date Planted	Maturity Date
Tomatoes	May 3	July 1
Sweet Corn	May 15	July 30
Green Beans	May 20	Aug. 5

Use What You Learn

What other kinds of record keeping could you use at home or at school?

How could you use a computer to help you keep records?

Take a Challenge

1. Keep a record of your family's vegetable purchases for a month. Include type of vegetable, amount bought and the cost.
2. Keep a record of your own spending for two months. Record the date, what you buy and the cost of each item.
3. Start a record-keeping system of the money you earn, spend and save.

Flower Arranging

Arranging flowers lets your creativity blossom. In Level 1, you learned about three common types of arrangements—the line, the mass and the line-mass. In this activity, you'll create a mass arrangement. A mass arrangement has a thick, full look. In this design, the whole piece is very colorful, with three or more colors combined with one or more kinds of leaves. The mass arrangement emphasizes the whole rather than the individual flowers and leaves.

Life Skill:

Communicating with others

Project Skill:

Flower arranging

What to Do:

Make a mass arrangement and then demonstrate the steps to others

Let's Explore

You need: a container; a block of wet floral foam; 10 to 12 light yellow, round flowers (zinnias, marigolds, geraniums, roses) about 2 inches in diameter with stems 10 to 12 inches long; 8 or 10 dark yellow,

round flowers 2 to 3 inches in diameter with stems 10 to 12 inches long; 5 orange, round flowers 2 to 3 inches in diameter with 6 to 8 inch stems; 8 to 10 stems of foliage such as yew or privet.

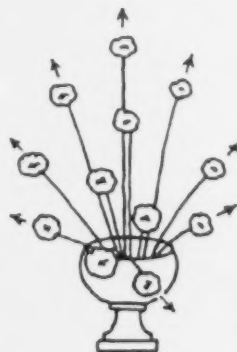
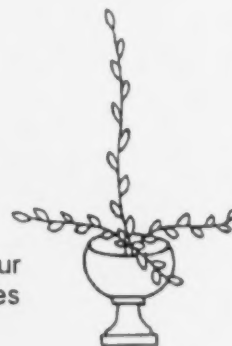
♦Cut the foam to fit into the container. It should extend about 1 inch above the top of the bowl.

♦Before you place the flowers, decide what shape you want the arrangement to be. Mass arrangements can be circular, dome-shaped, crescent, oval or triangular.

♦Insert a straight stem of foliage vertically in the center and at the back of the container. This sets the height. Place two look-alike stems almost horizontally, one on each side to form the width. Insert a shorter stem horizontally in front to form depth. Other stems of foliage are placed within these four stems to form the shape and size of the design.

♦Place 10 to 12 light-yellow flowers in first. Select the smallest flowers for height, width and depth. In other words, they should be at the highest and widest points of the arrangement and toward the inside. The height flowers should face up. The width flowers face left and right. The depth flowers face front and slightly down. The other flowers are placed in between to fill in the space. Let those in the center extend beyond the foliage to give depth and allow space for other flowers.

First Four Branches



Light Yellow
↑ = Facing

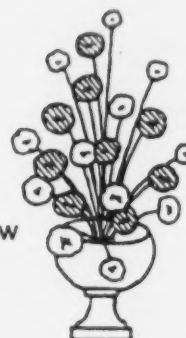
♦Put the 8 to 10 dark flowers inside and under the light flowers. They almost repeat the placement of the light ones.

♦Finally, place the five orange flowers to form a loose group that repeats the overall shape of the design. These are underneath the other flowers. Let them face front and slightly up.

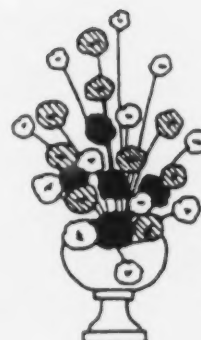
♦Don't overcrowd the flowers. Leave some spaces among the flowers so the viewer can look into the arrangement. *Bury* some flowers so they are partially hidden by others. This develops depth and eye penetration and adds mystery to your design.

♦Complete the activity by demonstrating a mass arrangement to your group.

Dark Yellow
Added



Orange
Added



Talking It Over

Share What You Learn

- What did you learn from doing the flower arrangement?
- What was the hardest part about giving a demonstration to your group?

Use What You Learn

Why is demonstrating a good way to communicate with others?

What are some other things you could do to practice expressing yourself?

Take a Challenge

1. Teach someone in your family or group how to make a mass arrangement.
2. Find out how many retail flower shops are in your community. Does your area need more?

You're the Judge

Have you ever been in the produce section of the grocery store and noticed how many people examine the vegetables before buying them? Or maybe you have watched your parent try to pick out the best looking house plant or flowers at the florist. Learning how to select quality horticulture products is a skill that takes practice and experience. This activity lets you be the judge in selecting the best horticulture products. This experience will also prepare you for exhibiting in county fairs or other horticulture shows.

Life Skill:

Communicating with others

Project Skill:

Selecting horticulture products

What to Do:

Judge horticulture exhibits and give oral reasons

Let's Explore

Set up four horticulture exhibits of the same kind. You can use four vegetable exhibits with all four exhibits having the same vegetables. Or try four house plants of the same kind or vases of cut flowers with the same flowers in each vase. Discuss the exhibits with your helper, explaining how you would rank them from best to worst. Make notes on the score cards to help you organize your reasons.

Then let your group or family rank the exhibits. Next, you be the judge and tell how you placed the exhibits, from first to fourth, and why you placed them that way.



Vegetable Note Card

	Exhibit 1	Exhibit 2	Exhibit 3	Exhibit 4
Clean				
Size, color, shape				
Dirt, cuts, bruises				
Insect/disease damage				
Development				

Cut Flowers Note Card				
	Exhibit 1	Exhibit 2	Exhibit 3	Exhibit 4
Size, color, shape				
Stage of opening				
Bruises/blemishes				
Development				

House Plant Note Card				
	Exhibit 1	Exhibit 2	Exhibit 3	Exhibit 4
Insect/disease damage				
Foliage size and color				
Even growth				
Neat, clean container				

Talking It Over

Share What You Learn

- What was difficult about this judging?
- Why is it important to know how to select the best horticulture products?

How can you use what you have learned to prepare for horticulture exhibiting?

Take a Challenge

1. Participate in a horticulture judging contest.

Use What You Learn

Why is it important to be able to give reasons for liking one thing more than something else?

How can you use your oral reasoning skills to become a better communicator?

Glossary

Air Layering: an asexual propagation method in which a stem develops new roots while still attached to the parent plant

Annual: a plant which grows, flowers, produces seeds, and dies in a single season

Asexual Propagation: a reproduction method in which a new plant is grown from a root, stem, or leaf, having the characteristics of only one parent plant

Bacteria: microorganisms which consist of one cell. Some, called germs, cause disease. Others, like those in soil, bring about decay.

Biennial: a plant which takes two years to complete its life cycle

Botanist: a person who studies plants

Cambium: a thin formative layer between the xylem and phloem of a plant that is responsible for secondary growth

Clone: an organism, such as a plant, descended asexually from a single ancestor

Complementary color scheme: a color plan that uses colors located opposite each other on the color wheel

Compost: a mixture of decayed organic matter generally used as fertilizer

Cutting: a piece of leaf, stem, or root that can develop into a new plant

Decompose: to break down into component parts; to decay or rot

Fertilizer: anything added to the soil to make it richer and to give plants more food

Flat: a shallow box in which plants are grown from seeds or cuttings

Foliage: the leaves on a plant

Fruit: the ripened ovary which contains seeds

Geotropism: a plant's movement in response to gravity

Germination: the development of a new plant from a seed

Herb: a plant or plant part valued for its medicinal, savory or aromatic qualities

Horticulture: the art and science of growing vegetables, fruits, flowers, and ornamental shrubs and trees

Humidity: the degree of wetness of the atmosphere

Hydroponics: the practice of growing plants in a nutrient solution, rather than soil

Hydrotropism: a plant's movement in response to water

Layering: an asexual propagation method in which roots are assisted to form on stems still attached to the parent plant

Leaf: an extension of the stem of a plant that turns sunlight into food

Manure: refuse from stables or barnyards that is used as fertilizer

Microbe: a minute life form

Monochromatic color scheme: a color plan of a single color or varying shades of a color

Mulch: a protective covering placed on the earth around plants to prevent weed growth, moisture loss, and freezing of roots

Nursery: a place where shrubs, trees, and small plants for flowers and vegetables are grown

Organic: made from things that are, or once were, alive rather than from chemicals or man-made materials

Peat moss: partly decomposed plant life, added to soil in a dried form to hold water and supply organic matter

Perennial: a plant which lives for more than two years, often for many years, as is the case of trees and shrubs

Perlite: a gray-white material of volcanic origin used mostly in potting soil for increasing aeration; also mixed with peat moss and used as a medium for rooting cuttings

pH: a measure of acidity of a solution

Phloem: the plant part that carries food which the plant has made

Photosynthesis: the process by which chlorophyll-containing cells in green plants convert light to energy

Phototropism: a plant's movement in response to light.

Plant food: a liquid or powder fertilizer which can be added to the water that is given to potted plants

Pollen: the small dust-like male particles in a flower

Pollination: the process in which pollen from the anther of a flower is transferred to the stigma of the same or another flower

Potting soil: a special soil for potted plants that is sold in bags

Propagation: growing a new plant from a plant part such as a root, leaf, or stem

Root: the underground part of a plant that anchors the plant, absorbs water and minerals, and sometimes stores food

Seedling: a young plant grown from seed

Sexual propagation: the natural reproduction of plants in which a seed is formed, having characteristics of both parent plants

Simple layering: an asexual propagation process that occurs when flexible branches of a plant touch the soil and take root, forming a new plant

Stem: the part of a plant that holds it upright, supporting flowers and leaves

Succulents: fleshy plants whose thick leaves and stems hold supplies of water

Terrarium: an indoor miniature landscape in a covered glass container

Transpiration: the process in which water vapor is lost by land plants. It usually takes place through the leaves.

Transplant: a plant that is moved from one place to another

Tuber: a short, thick underground stem

Variety: a group of individual plants within a plant species with only slight differences

Vermiculite: a micaceous mineral that expands when heated and has the ability to hold water and nutrients; used for starting seeds and cuttings or added to a soil mix

Xylem: the plant part which carries water and mineral salts to all parts of the plant

Yield: the amount or quantity produced

Resources

Miller, Marie. (1981). *New Dimensions in Floral Design*. 1981.

Ortho Gardening Series. San Francisco, CA: Chevron Chemical Co., Consumer Products Division.

Sunset Gardening Series. Menlo Park, CA: Lane Publishing Co.

Voigt, C. E., and J. S. Vandemark. (1995). *Vegetable Gardening in the Midwest*. Urbana, IL: University of Illinois Cooperative Extension Service Circular 1331.

Internet Sites

Virtual Garden
<http://pathfinder.com>

Hartley Garden at UI Arboretum
<http://w3.ag.uiuc.edu/HORT/arb-broc.html>

Purdue University
<http://flowers.hort.purdue.edu>

Exhibiting Tips

Here are general guidelines for exhibiting a horticulture project. Check your local 4-H show book for specific exhibit requirements.

Herbs

Select herbs that are free of blemishes, bruises, and insect and disease damage.

Fresh cut: 12 stems or branches tied into 1 bunch with stem measuring 1 inch in diameter

Potted: 1 plant per container, or a combination of 2 or more plants

Annual Flowers

Check your 4-H show book to find out about the number of stems and kind of container to use for different kinds of flowers.

Select and cut flowers in the late afternoon or early evening before the show. If cutting flowers late in the day is not possible, you can cut them the morning of the show. Cut the stems longer than needed. Remove any leaves halfway up the stem. Immediately place the stems in a container of warm water.

House Plants

Exhibit a plant in the container in which it has been growing. Plant should be free of bruises, torn leaves, and insect and disease damage.



Vegetables

Check your show book to find out how many vegetables to exhibit and how to display them (on paper plates, in a container, etc.)

When exhibiting more than 1 specimen, select vegetables that are similar in size, shape, color, and stage of maturity. Choose vegetables that are free of dirt, cuts, bruises, defects, and insect damage. Make sure they are high quality and true to the variety.

One specimen: broccoli (head); cabbage; cauliflower; Chinese cabbage (head); eggplant; greens (collard, endive, kale, escarole, mustard, Swiss chard)—1 plant; winter squash; pumpkin; watermelon; horseradish—root; lettuce—one head or plant; muskmelon

Five specimens: asparagus spears; beets; carrots; sweet corn; pickling cucumber; slicing cucumber; kohlrabi; leek; large dry onions; parsnips; large peppers; popcorn ears; Irish red potatoes; Irish white potatoes; sweet potatoes; rhubarb stalks; turnips; summer squash; slicing tomatoes

Twelve specimens: green beans (pods); lima beans (pods); wax beans (pods); okra; green onions; set onions; peas (pods); small fruit peppers (chili, cherry, etc.); shallots; small fruit tomatoes

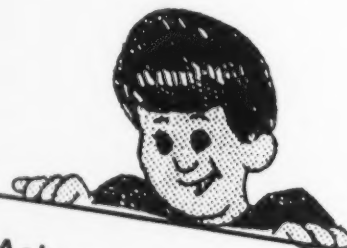


College of Agricultural, Consumer and Environmental Sciences

University of Illinois at Urbana-Champaign

Copyright 1996 by University of Illinois Board of Trustees

Authors and publishers have granted permission for copies of this work or parts of this work to be reproduced, provided that (1) copies are distributed at or below the cost of reproduction; (2) the author, the publication, and the University of Illinois College of Agricultural, Consumer and Environmental Sciences and the relevant division within the College are identified; and (3) proper notice of copyright is affixed to each copy.



Acknowledgements

Curriculum Coordinator:
Ann Rund

Extension Specialist, Youth Development
Content Specialist:
Jim Schmidt

Extension Specialist, Horticulture
Writer/Designer:
Annette Campbell

Extension Educator, Communications
Editor:
Phyllis Picklesimer

Artist:
Jerry Barrett



4-H Publication MJ0605
September 1996



Cooperative Extension Service
University of Illinois at Urbana-Champaign

In furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, D.R. Campion, Interim Director, Cooperative Extension Service, University of Illinois at Urbana-Champaign. The Illinois Cooperative Extension Service provides equal opportunities in programs and employment.

4-H Horticulture Unit 3

Digging Deeper



Project Activity Guide

Name _____ Age _____ County _____

Contents

Note to the Project Helper	3
Horticulture Fun	4
Plans and Highlights	5
My Horticulture Achievements: Unit 3	6

Planning for Success

Life Skill: Planning and Organizing

Taking the Chill Off	8
On the Road	10
Landscaping Basics	12
Setting the Stage	14

Taking the Lead

Life Skill: Leading Self and Others

Plant Experiments	16
Herb Teacher	18
Flower Arranging	20

Showing and Sharing

Life Skill: Communicating

Thoughts to Words	22
Debating the Issue	24
Hort Talk	26
Video Gardening	28

Your Future

Life Skill: Planning Your Life

Plants Into Profit	30
Exploring Careers	32
Try It On	34

Glossary	36
Resources	37
Exhibiting Tips	38

Note to the Project Helper

Welcome to the 4-H horticulture project. As a project helper, you have an important role in guiding, supporting, and encouraging youth. This project guide is designed to help youth actively explore the world of horticulture. It includes hands-on horticulture activities for both indoor and outdoor fun. Youth should have completed Levels 1 and 2 of the 4-H horticulture series or have some experience with plants and gardening before enrolling in this unit. In this challenging Level 3 project, young people use horticulture activities to develop leadership and improve their communication and planning skills. They also explore the many career opportunities in the horticulture field.

Horticulture Project Guides

The three 4-H horticulture project guides are designed for beginning, intermediate and advanced learners. In each lesson, you will find a learning activity that emphasizes a project skill and a life skill. This Level 3 project focuses on four life skills: organizing, leading self and others, planning your life, and communicating with others.

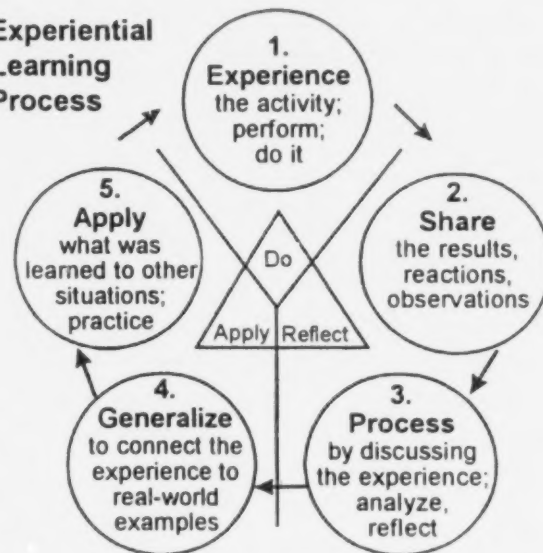
Each project guide includes *Let's Explore* activities to help youth learn by doing. The *Talking It Over* sections help youth process what they have learned as they discuss the experience with you. Keep in mind that most of the questions in this section will not have a right or wrong answer. Your goal is to help youth clarify and expand on their own ideas. *Take a Challenge* sections provide additional learning activities that enhance the project experience. Each project guide also includes an achievement program to recognize youth for their accomplishments.

Leader's Guide

The 4-H horticulture series also includes a Leader's Guide. This publication provides more specific content information as well as fun learning activities for groups. These

activities are suitable for families, classrooms, 4-H project groups, or other clubs and groups. You will also find information about the experiential learning model and how to use it to promote life skill development.

Experiential Learning Process



4-H: Experiential Learning

This learning method—doing an activity, reflecting on the experience, and applying the new knowledge—is called the Experiential Learning Model. This model is what distinguishes 4-H youth development education from other formal education methods. Each lesson in the 4-H horticulture series uses the experiential learning model to help youth get the most out of the learning experience.

As you can see from the diagram above, youth first try to do the activity on their own. Then, you meet together to talk about the experience. With your guidance, youth reflect on what they did and how they can apply the learning to other situations. Your ability to help youth clarify and expand their ideas will enhance the overall project experience. Good luck!

Horticulture Fun

As an experienced gardener, you have learned a lot about plants and the horticulture field. Whether you grow plants indoors or outdoors, you have a lot to share with others. Level 3 of the 4-H horticulture project gives you lots of opportunities to develop your leadership skills, organizational abilities, and presentation skills. You can conduct a gardening workshop, teach younger members how to grow plants, or arrange a tour for your group. You can produce a video, give public presentations, or host a debate. You can even market your horticulture products or work as an intern in a horticulture business. All kinds of exciting opportunities await you in the 4-H horticulture project. Set high goals for yourself and see just how far you can go.



Horticulture 3 Project Guidelines

- Do at least four required activities and three challenge activities each year.
- Complete Level 3 within three years.
- Participate in at least three of the learning experiences listed on page 5 each year.
- Record project goals and accomplishments.
- Practice the life skills emphasized in this unit: planning and organizing, communicating, leadership, and planning your life.

Horticulture Activity Guide

The activities in this guide will give you new challenges to explore. Work with your project helper to complete each activity. Remember, this guide is not designed to provide you with answers to all of your questions. Learn to find and use resources such as gardening books, videos, Extension Service educators, other gardeners, and horticulture professionals.

Record your goals and work in this guide. A written record will be useful as you progress through Level 3. It will also reflect all that you have learned and accomplished in the project.

Your Project Helper

As you have probably learned from Levels 1 and 2, a project helper is a great resource. Choose someone who will support your efforts to complete the horticulture achievement program. Your helper will meet with you to set goals, suggest resources to use, and give feedback as you complete each activity. Write the name and phone number of your project helper below.

Project
Helper: _____

Phone: _____

Plans and Highlights

Horticulture Project Goals

Name _____

Goals for the Level 3 horticulture project:

Year _____

Year _____

Year _____

Horticulture Highlights

Date and list important things you do and learn.

Major Learning Experiences

Date any of these things that you do.

Year	Year	Year	Activity
			Give a public presentation
			Attend a horticulture show
			Conduct a horticulture clinic
			Participate in a horticulture judging contest
			Join a gardening club
			Organize a horticulture activity for your group
			Exhibit at a fair
			Judge at a horticulture show

My Horticulture Achievements: Unit 3

Directions:

1. Do at least four required activities and three challenge activities each year.
2. Finish at least 20 activities in three years to complete this level.
3. Date each activity when you complete it and have your project helper initial it.

Required: Complete at least three of the four activities in the section, *Planning for Success*.

Helper	Date	Activity
		Taking the Chill Off
		On the Road
		Landscaping Basics
		Setting the Stage

Required: Complete at least two of the three activities in the section, *Taking the Lead*.

Helper	Date	Activity
		Plant Experiments
		Herb Teacher
		Flower Arranging

Options: Complete any of the challenges on pages 8 to 15.

		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Write your own challenge here:

Options: Complete any of the challenges on pages 16 to 21.

		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Write your own challenge here:

Required: Complete at least three of the four activities in the section, *Showing and Sharing*.

Helper	Date	Activity
		Thoughts to Words
		Debating the Issue
		Hort Talk
		Video Gardening

Required: Complete at least two of the three activities in the section, *Your Future*.

Helper	Date	Activity
		Plants Into Profit
		Exploring Careers
		Try It On

Options: Complete any of the challenges on pages 22 to 29.

		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Write your own challenge here:

Options: Complete any of the challenges on pages 30 to 35.

		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Take a Challenge page ____ # ____
		Write your own challenge here:

I certify that _____ has completed the Level 3 horticulture project.

Project Helper's Signature _____ Date _____

Planning for Success

You have probably found that the older you get, the more demands you have on your time. Schoolwork, household jobs, clubs or groups and sports are just some of the activities that keep you busy. Learning how to manage your time is an important skill for success in life.

The key to managing your time is planning and organizing. Planning your work, projects and activities helps you get things done on time. In this section, you'll use your planning skills to complete new projects and organize activities for your group.

Taking the Chill Off

How do you start seeds early in the spring or extend the growing season into late fall? Do it with a coldframe. A coldframe is a box without a bottom that is covered with a light-admitting lid. The frame is filled with soil for growing plants. You can start cool-season vegetables in a coldframe and then transplant them in a spring garden. You can also use a coldframe to grow vegetables for late fall and winter. Planning is critical for a successful coldframe. You need to carefully plan the construction and the site for your coldframe.

Life Skill:
Planning and organizing

Project Skill:
Growing plants in a coldframe

What to Do:
Build a coldframe and plant seeds or small plants

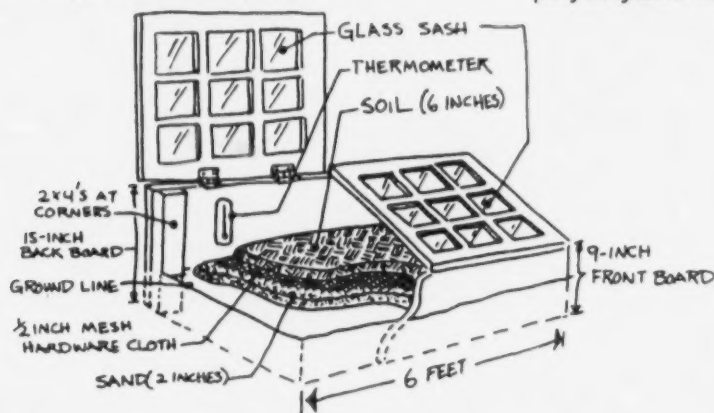
Planting also has to be timed so that spring plants are ready for a garden and fall plants are ready for harvest before winter.

Let's Explore

In this activity, you will build a coldframe and then plant some seeds or young plants. Start by deciding where to locate the coldframe. A well-drained slope that is protected from wind and facing south is a good choice. Next, organize the construction materials and build your coldframe. Then figure out your planting date and set your seeds or plants.

Construction Tips

- The size should be at least 3 feet by 6 feet.
- The frame should be about 9 inches high in front and about 15 inches high in the back. This slope helps water drain off properly.
- An old window or a wood frame covered with polyethylene can be used for a lid.



- If the frame is made of wood, use boards that are 1 or 2 inches thick. If the frame is brick, concrete, or stone, set the foundation a few inches below the frost line.

- Partially bury your coldframe to retain more heat.

Planting Tips

- Use loose, well-drained soil. A good mixture is: 2 parts garden loam, 1 part sharp sand, and 1 part compost, peat moss or well-rotted manure.
- Fill the frame with about 9 inches of soil.
- Cool-season vegetables such as cabbage, lettuce, broccoli and cauliflower require low temperatures for seed germination. They can be started in the spring eight weeks before transplanting into a garden.
- Warm-season vegetables such as pepper, tomato, squash and melon can be started about two weeks after the cool-season plants.

Managing a Coldframe

- Use a thermometer to monitor daily temperatures. Keep the temperature below 75° to 80°. Too much heat on a warm day can damage plants inside and create high humidity that encourages disease. To cool the inside temperature, prop the sash open.
- On very cold nights, prevent freezing temperatures inside the frame by covering the frame with straw, hay, crumpled newspapers, tarps or old blankets.
- Check plants daily and water if the soil feels dry. Water plants early in the day.

Talking It Over

Share What You Learn

- What factors did you consider in selecting your site and materials for the coldframe?
- How did you determine the planting date for your seeds or plants?
- What successes or problems did you have growing plants in the coldframe?

Use What You Learn

What other projects and activities have required your planning skills?

How do new projects develop your planning and organizational skills?

Take a Challenge

1. Research other ways to protect plants started outdoors early in the season.
2. Help someone else build a coldframe.
3. Design and build a hotbed.

On the Road

Horticulture is a booming business throughout the United States. Flower shops, tree farms, greenhouses, nurseries, orchards, vegetable farms and landscaping firms are just a few of the many types of businesses that deal with plants. A tour of a horticulture business is a real eye-opener for many youth. Take the lead in providing this experience for your group—plan a fun learning tour.

Life Skill:
Planning and organizing

Project Skill:
Learning about
horticulture businesses

What to Do:
Organize a group tour of
a horticulture business

Let's Explore

Contact a horticulture business in your area and arrange a group tour. Give the business owner details about your group, such as how many are in the group and the age range. Find out what kinds of things members will see and how long the tour will take. If it's an outdoor tour, have a plan for dealing with bad weather.

Then meet with your group and tell them about the tour you have planned. Give them the date and time and arrange for transportation. Also, brainstorm with your group to come up with some questions they will want to ask. After the tour, lead a discussion about what the group members learned from the experience.

Group Tour

Business Name:

Location:

Tour Date/Time:

Departure Place:

Departure Time:

Transportation Notes:

Questions to Ask:

Sample Questions

- What products/services do you provide?
- How long have you been in business?
- Who are your customers?
- Who are your competitors?
- What does it take to start a business like this?
- What kind of training or education is needed to run a business like this?

Discussion Starters After the Tour

- What was the most interesting thing you learned?
- How can you use what you learned?
- What other horticulture businesses does our community need?
- What did you like about the tour?
- What did you dislike about the tour?
- What other places would you like to tour?

Talking It Over

Share What You Learn

- Tell your helper about your experience in organizing the tour.
- What went well? What could have gone better?
- What did the after-tour discussion reveal?

What were the most important points made by the presenter on the tour?

Use What You Learn

How did you make the tour both fun and educational for your group?

What advice would you give to someone organizing an activity for the first time?



Take a Challenge

1. Organize an activity for your group in which you take on the leadership or teaching responsibility.

Landscaping Basics

Landscaping is the art of designing outdoor space for convenience, beauty and pleasure. A well-designed landscape can improve homes, schools, churches and community buildings. Landscaping starts with a site analysis—a drawn picture of all the things already on the site such as a house, trees, sheds, garbage cans and clotheslines. Then a plan for improving the site is drawn. This plan includes trees, shrubs, flower beds and ornamental plants.

Life Skill:
Planning and organizing

Project Skill:
Learning how to landscape

What to Do:
Make a site analysis and a landscape plan

In this activity, you will discover the many questions and decisions that go into landscaping as you complete a site analysis and design a landscape plan.

Let's Explore

Start by gathering information and books about landscaping. Your library and Extension Service are good sources to check. Make a site analysis for your home or another site.

Then design a landscape plan based on your site analysis. Your knowledge about plants that grow well in your area will be needed. If possible, implement part of your landscape plan.

Making a Site Analysis

Use a piece of graph paper to draw to scale: the curb line, street, fence or property line; the compass directions; the house, garage, sidewalk and driveway; all utility lines (gas, sewer, water, electric); all trees, shrubs, flower beds and garden areas; and storage buildings, clothesline, dog pen, compost pile and any other structures on the site.

Divide the site plan into three areas—the public area, private area and service area.

The public area lies between the road and the house and is in full view of the public.

The private area is usually the property to the rear of the house and might include a patio or deck, lawn furniture, swimming pool and other things the family uses for outdoor living. The private area can also include side-yard spaces if they are wide enough to use.

The service area is usually located to the rear or side of the house. This area might include garbage cans, clotheslines, storage buildings and vegetable gardens. The service area should be screened from public view.

Mark the views that you want to save and the views that you want to hide. For example, you might want to make sure a flower bed can be seen but a garbage can is hidden.

After you have completed your site analysis, it's time to design some possible landscape plans. Place tracing paper over your site drawing and sketch possible arrangements for each of the three areas. Keep your family's daily activities and needs in mind as you design your plan.

Share your designs with your family to see if the arrangements meet their needs.

Plants in the Landscape

- Foundation plantings anchor the house to the ground, soften corners and cover unattractive foundations. Shrubs are a good choice here. Select shrubs based on their mature height. You don't want shrubs that grow 8 feet tall under a low window.
- Trees frame a house. Picture an imaginary line extending from the two major side walls of the house. Place a tree a few feet outside each of these two lines to frame the house. Never plant a tree directly in front of a house. Large shade trees planted to the rear of the house provide a background.
- Hedges can serve several purposes. Tall hedges can screen unsightly views. Medium-height hedges can serve as a fence. Low hedges can designate boundary lines.
- Vines are also quite useful. They can help screen unattractive fences, buildings and walls. Check the characteristics of vines you select to make sure they will not damage the structure on which they grow.
- Flowers are accessories in a landscape. Flowers should complement the house, not compete with it for attention. Flower beds are often located in the rear of the house where more outdoor living takes place.

Talking It Over

Share What You Learn

- What was the hardest part of developing a landscape plan?
- How did you deal with poor views?
- What were the most important things you learned from the activity?

Why is having a plan on paper critical to successful landscaping?

Take a Challenge

1. Design and implement a landscape plan to improve a site in your community.
2. Take a bicycle tour to identify good landscaping in your community.

Use What You Learn

What other written plans could help you achieve your goals in life?

Landscaping improves the first impression of a house. How can you improve the impression that others have of you?

Setting the Stage

Over the years you have learned many things about indoor and outdoor gardening. Now you are ready to set the stage so that others can learn. In this activity, you will organize a gardening clinic to help others learn basic skills for growing plants. Planning will be important as you decide what topics to cover, what supplies are needed, how to promote the program, and who the teachers will be.

Life Skill:

Planning and organizing

Project Skill:

Organizing a gardening clinic

What to Do:

Plan and conduct a gardening clinic

Let's Explore

With a partner, plan a gardening clinic that includes three hands-on learning experiences for participants. Determine who your audience will be and what topics are important to them.

Contact people who can do the teaching. You may want to teach one of the topics yourself. Complete the gardening clinic plan and then promote, implement and evaluate your program.

Gardening Clinic

Date of Clinic:

Target Audience:

Starting Time:

Clinic Promotion:

Place:

Schedule

Time	Topic	Who Will Cover	Supplies/Equipment

Talking It Over

Share What You Learn

- What was hard about the planning process?
- What happened at the program?
- How successful was the event?

What teaching methods did the instructors use?

What did the participants learn as a result of your program?

Use What You Learn

What did you learn about your organizational skills? How can you improve your skills?

What will you do differently next time?

Planning Tips

ORGANIZE – Plan the program with your audience in mind. Good planning starts with asking questions. Will a daytime or evening program have the best attendance? What topics would interest beginning gardeners? Will the focus be on indoor or outdoor plants or both? Who will teach the topics? Keeping these questions in mind will help you plan a successful program. Make sure you have all the supplies that will be needed. It's also a good idea to contact the teachers a couple of days before the event, just to make sure everything is set.

PROMOTE – Announce the event by sending a news article to area news media. Work with local Extension Service offices and garden clubs to get publicity in newsletters. You can also send invitations to 4-H members enrolled in horticulture projects.

IMPLEMENT – Carry out your plan so that participants have fun while they learn. Ask the instructors to provide hands-on learning activities for the participants. For example, a session on propagation could include practicing a stem or leaf propagation. Sessions can be run as simultaneous stations with small groups of participants moving from station to station.

EVALUATE – Before the participants leave the clinic, ask them to write one new thing they learned or especially enjoyed. Make your own notes about what went well and what needed to be improved.

Take a Challenge

1. Offer to teach your gardening clinic in another county.
2. Organize a horticulture judging contest for your group.

Taking the Lead

Have you ever thought that some people were just natural leaders? A closer look would probably tell a different story. Leaders start with a good understanding of themselves. They are confident in themselves and what is important to them. They have developed the necessary skills to help

others achieve their goals. Leadership doesn't happen overnight. Leadership skills are learned through practice and experience, and working with a group is a good way to get this experience. Use the activities in this section to take the lead in helping others learn.

Plant Experiments

What plants would grow well in my area? When should I plant? Should I use fertilizer? These are just some of the many questions that young gardeners have. You can help youth find answers to their questions through experiments. When young people discover things for themselves, the learning becomes more meaningful. This makes experiments an effective teaching method. In this activity, you will practice your leadership skills as you guide a young person through an experiment.

Life Skill:

Leading self and others

Project Skill:

Designing plant experiments

What to Do:

Help someone else design and implement a plant experiment

Let's Explore

Start by explaining the problem-solving steps to a novice gardener. Then help the gardener identify a plant question to explore. Work with the young person to complete the experiment outline and implement the experiment. Finally, discuss the results with the gardener, asking questions that will reinforce what was learned.

Problem-Solving Steps

1. Decide on a problem to explore.
2. Predict what will happen.
3. List the steps to take to find the answer to the question.
4. Write down observations. Describe or draw what is happening. Compare the results with the prediction.
5. Make conclusions about the results—why it turned out the way it did.

Sample Experiments

- Compare the growth of two identical house plants in the same location. Feed one with soluble fertilizer but not the other.
- Compare planting dates and yields. Plant seeds at three different intervals: the recommended time, earlier than recommended, and later than recommended.
- Compare the results of different fertilizers on two identical rows of plants.
- Compare different types of mulches or depths of mulches on identical plants.
- Compare the growth and yield of two different varieties of the same plant—one that is disease-resistant and one that is not.
- Compare the growth of two identical house plants getting different amounts of light.

Experiment Outline

Question: _____

Prediction: _____

Steps to Take: _____

What Happened: _____

Conclusions: _____

Talking It Over

Share What You Learn

- What did the participants learn from doing the plant experiments?
- Was the activity a positive learning experience? Why or why not?
- How did you feel about teaching others?

What will you do differently in your next teaching situation?

Take a Challenge

1. Attend a field tour to observe large-scale vegetable, fruit, turf or flower trials.

Use What You Learn

Why is it important to evaluate the effectiveness of a learning method?

What other times have you evaluated in order to improve on something?

Herb Teacher

Herbs are fun to grow, easy and beautiful. This makes herb gardening an ideal activity for young gardeners. Herbs can be grown in any soil where vegetables thrive. They can also be grown indoors in containers or pots. Herbs are started from seeds, plants or rooted cuttings. Food experts classify herbs into two groups: robust herbs which are added while food is being prepared or cooked, and fine herbs which may be eaten uncooked in salads and sprinkled over food. In this activity, you will teach youth how to

Life Skill:

Leading self and others

Project Skill:

Growing herbs

What to Do:

Teach others how to grow an herb garden

grow herbs in containers. They will benefit from your knowledge, and you will get some practical experience in leading a group.

Let's Explore

Identify three or four young gardeners who are interested in starting an herb garden. Then use the experiential learning model to develop

a teaching plan that will help youth learn how to grow herbs in containers. Discuss your plan with your helper and use it to teach youth.

Teaching Plan for Herb Gardening

Activity

Develop a hands-on activity to get youth involved and excited about learning.

Supplies Needed: _____

Sharing

Write questions that you will ask learners about the activity.

Processing

Write questions that will help learners identify what was important in the activity.

Generalizing

Write questions that will help learners see how the experience relates to their lives.

Applying

Write questions that ask learners how they can apply what they learned to their lives.

Talking It Over

Share What You Learn

- How did you use experiential learning to teach others about herb gardening?
- How did it feel to teach others this way?
- What were the successes and challenges you encountered with the activity?

How is the experiential learning method different from the ways you have been taught?

Use What You Learn

What can learners gain by trying something before being told or shown how to do it?

What are some situations when experiential learning is the best teaching method? When would other teaching methods such as videos, lectures or demonstrations be better?

Experiential Learning Process



Take a Challenge

1. Observe other people teaching groups. Are their teaching methods effective?
2. Make a chart that illustrates appropriate teaching methods for five different learning situations.
3. Develop a teaching plan on plant propagation methods. Use the plan to teach a small group.

Flower Arranging

One of the best ways to learn a new skill is to teach others how to do it. In this activity, you will combine your leadership skills with the knowledge you have about flower arranging to teach another person how to make a line-mass arrangement. This arrangement has a neat look with a definite line, a well-defined mass and plenty of open spaces. In a line-mass arrangement, either the line or the mass is the focus. Feature the line if it is special. Show off the mass material if it is more interesting in color and texture.

Life Skill:

Leading self and others

Project Skill:

Making a line-mass flower arrangement

What to Do:

Learn to make a line-mass arrangement and teach others how to do it

Let's Explore

Use the instructions below to learn how to make a line-mass arrangement. After you feel confident with your skills, help another person

learn how to make the arrangement. Use what you have learned about experiential learning in your teaching.

Making the Line-Mass Arrangement

You need: a container such as a shallow bowl, 6 to 8 inches in diameter; a block of wet floral foam; 3 branches of the same kind; 3 to 5 branches of a second kind; 5 to 7 round flowers in similar colors but different sizes; a few twigs of fresh foliage.

Cut the foam to fit into the container. Place the foam to the left and back of the container.

Cut the three same stems so that one is tall, one is medium and one is short. Insert the tall branch in the foam to set the height and vertical line. Put the next tallest branch close to the first branch and slightly to the left and back. Place the shortest branch in front of the first branch, letting it slant slightly to the left of the second branch. These three branches should form a grouping.

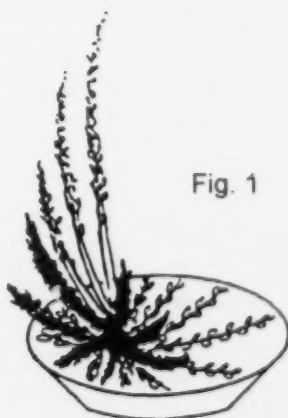


Fig. 1

Next place the 3 to 5 stems of the second kind to the left and in front of the first main branches. Choose either straight or curved stems to match the curved or straight main branches. This second set of stems repeats the line of the first three stems at the top but then spreads out near the container to give a fuller look (Fig. 1).

Fill in around the branches with small foliage.

Now place the flowers among the branches and foliage to form an upright triangle pattern. Use the smallest flower for the tallest placement and have it face up. Stems of the other flowers should be different lengths, but shorter than the smallest flower. Face the flowers in several directions. Let some flowers be hidden by other materials (Fig. 2).

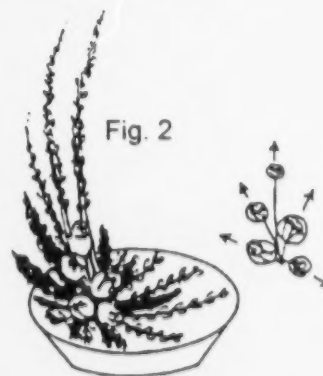


Fig. 2

Design Principles: A Closer Look

Proportion is the size and shape relationship among the things in the arrangement. The plant material should be about three-fifths and the container two-fifths of the finished design.

Scale is the size relationship between different flowers or between flower and container. Flower sizes should be about the same, but you can use larger leaves or flowers for variety and contrast. No flower or leaf should be more than one-third the size of the container.

Balance means that the finished arrangement does not look as if it will fall over. Check the balance from side to side, top to bottom and front to back. Symmetrical balance means that one side of the arrangement looks just like the other side. These arrangements appear formal, restful and dignified. With asymmetrical balance the plant material and placement are different on each side of a vertical axis that divides the

arrangement in half. Asymmetrical arrangements are more informal, active and stimulating.

Rhythm means related movement. Arrangements with strong movement lead your eye along a visual path. Each kind of plant grows according to its own built-in rhythm. The cattail is vertical; weeping willow branches curve and droop; ivy grows horizontally. Most plants grow so that stems radiate from one place in the ground. In flower arrangements, stems are held together by the holder and radiate from the container. Repeat a line, shape, color, texture or space to achieve strong rhythm.

Emphasis tells the viewer what is most important in the arrangement. The center of interest is slightly above the point where everything meets. Place the largest, most colorful flower there. Line arrangements are best without a center of interest since their appeal is in the lines.

Talking It Over

Share What You Learn

- What was the learner's experience?
- How did experiential learning guide your teaching plan?
- What was the hardest part of this activity?

How did your teaching method compare to the way you learned about flower arranging?

Take a Challenge

1. With a friend, produce a video on making a flower arrangement.
2. Use the design principles above to plan a flower-arranging judging activity.

Use What You Learn

What did you learn about your leadership skills through this teaching activity?

How can you use your leadership skills to help others learn new things?

Showing and Sharing

Look around you. You'll see communication everywhere. Printed materials, phone calls, radio advertisements, interactive computer programs, television and personal dialogue are just a few of many communication messages you encounter every day. Effective communication skills are

critical to everything in your life—from your personal relationships, to school, to jobs. If you observe successful people, you'll see that they have learned how to communicate effectively. The following activities will give you a chance to practice your communication skills in new ways.

Thoughts to Words

Have you ever noticed how some instructions for making or building things are confusing or unclear? Writing easy-to-understand instructions is a communication skill that takes time and practice to develop. Once you master this type of technical writing, you begin to critically look at all of your writing for clarity. In this activity, you will find out how written instructions are developed, tested and then revised for a given audience.

Life Skill:

Communicating with others

Project Skill:

Forcing bulbs

What to Do:

Write and illustrate instructions on how to force bulbs. Test and revise the instructions.

Let's Explore

Using the information here along with other resources, write step-by-step instructions on how to force bulbs indoors. Design the piece for youth ages 8 to 10. Include drawings or diagrams that support your information. Keep in mind that young learners usually do best with numbered steps, small words and short sentences. Ask at least three youth to read the

instructions and explain what they would do. Make changes to your writing based on the responses of your test audience. Repeat the testing and revising process until you are comfortable that most children ages 8 to 10 could successfully follow your instructions. Then make the print piece available to others.

Planting Bulbs

Start the bulbs in late October. Use clean flower pots, preferably clay. Make potting soil by mixing equal parts of soil, peat moss, and perlite or vermiculite. Do not add fertilizer. Cover the bottom of the pot with shards. Add soil mixture based on the bulbs to be planted.

After all of the bulbs have been set, add more soil and press it firmly around the bulbs. Allow a 1/2- to 1-inch space at the top of the pot for watering. Water the bulbs until water drains out of the bottom of the pot.

Tulips: Place bulbs so the flat side faces the outside. Only the top of the bulb should stick out of the soil. Use 6 to 7 bulbs per 6-inch pot.

Hyacinths: Place so that only the tops of the bulbs stick out of the soil. Use 3 to 5 bulbs per 6-inch pot or 1 bulb per 4-inch pot.

Daffodils: Place so that half of the bulb shows above the soil line. Use 5 bulbs per 6-inch pot.

Crocuses, snowdrops, grape hyacinths: Place the bulbs 1 inch below the soil surface. Use 8 bulbs per 6-inch pot.

Cooling

The cooling stage imitates the process that bulbs go through when they are outdoors. Keep pots in a cool place, 40° to 50°F, until roots grow. This will take about 10 to 12 weeks. An ideal place to cool the bulbs is in the ground. Choose a spot close to your house where water will not flood the hole. Dig a trench 15 inches deep. Place the pots in the trench so that they touch each other. Cover the pots with leaves. If outdoor cooling is not possible, you can store the bulbs in a basement, root cellar or refrigerator. Just make sure the temperature is around 40°F.

Forcing

After the bulbs have been chilled, they are ready to be forced. Take the pots from their cooling place and check the moisture. Water if the soil is dry. The bulbs should have yellow-green sprouts showing. If you take the plant out of the pot, you should see the plant's roots. Move the pots to a place that is partly shaded and cool (60° to 65°F). After shoots begin to grow, move the pots to a warmer area with more light. But do not put the pots in direct sunlight. You can help the blooms last longer by putting the pots in a cool place at night. Once the bulbs have quit flowering, discard them. Or if you have yard space, you can plant them outside in late spring.

Talking It Over

Share What You Learn

- What was the process you used to develop your instructions?
- What resources did you use?
- How did you feel about technical writing?

How was this experience different from other communication methods you have used?

Take a Challenge

1. Find some instructions that are difficult to understand. Rewrite the instructions and test them on an appropriate audience.

Use What You Learn

What makes written instructions harder to develop than oral instructions?

What are other situations in which you could use technical writing to communicate?

Debating the Issue

Public debates have a long history of helping people communicate their views. Politicians, religious leaders, school officials, parents and youth all debate issues that are important to them. In recent years, people have debated the pros and cons of organic versus traditional gardening. Some people think that all plants should be grown organically. Others think that some chemical insecticides and fertilizers are necessary. What are your views? This activity will give you a chance to explore the issue as you practice your oral communication skills.

Life Skill:

Communicating with others

Project Skill:

Learning about organic and chemical fertilizing and insect control

What to Do:

Organize, conduct and participate in a debate

Let's Explore

Start by organizing a group of friends and family who will participate in a debate. Explain that the topic is: *Organic versus Traditional Gardening*. Ask your friends and family to pick one of these two positions:

1. All plants should be grown organically.
2. All plants need some chemical fertilizer and insect control.

Ask the participants to prepare a 4-minute presentation to persuade others of their views. Also, pick a position for yourself and prepare your own presentation.

Conduct the debate so that each presentation is followed by a question and answer period. Record key points of each position. Then discuss the debate process with your group.

Organic vs. Traditional Gardening

Position:

Pros:

Cons:



Some Points to Consider

Organic Gardening:

- Some plants, such as marigolds, contain substances that kill or repel nematodes and aphids. But you can't get this benefit with just a few plants of most varieties.
- It may take weeks or even seasons for beneficial insect populations to build to a level that will help control damaging insects.
- Some plants can be grown with little or no danger from insect pests.
- Organic fertilizers help improve soils but are low in nutrients.

Traditional Gardening:

- Chemical insecticides give quick results.
- Many insecticides kill all insects, including the beneficial ones.
- Beneficial insects take longer to return to an area that has been treated with insecticides than do damaging insects.
- Plants don't know the difference between organic and chemical fertilizers.
- Chemical fertilizers are economical.
- Nutrients in chemical fertilizers are available as soon as they are added to the soil.

Talking It Over

Share What You Learn

- How did you organize the debate?
- What verbal and nonverbal communication did each participant use?
- How do people form their beliefs about an issue?

Use What You Learn

What verbal and nonverbal communication techniques can be used to help persuade others toward your position?

What other times will persuasive speaking skills be useful to you?

Take a Challenge

1. Join a school debate team.
2. Observe a public meeting in which a controversial issue is debated.
3. Learn about different issues related to integrated pest management. Share your findings with your group.

Hort Talk

Our world is filled with visual images, from televisions to billboards to the packaging on your favorite products. Visual aids are used to persuade, teach and sell. Charts, pictures, posters, displays and models are only a few of the visuals used in oral communication. Good visuals help an audience *see* your point and make a presentation more lively. Horticulture topics are well suited to illustrated talks. Displays of bulbs or seeds, plates of vegetables or a poster illustrating information on a seed packet are just a few possibilities for making a presentation come alive.

Life Skill:

Communicating with others

Project Skill:

Presenting horticulture information

What to Do:

Prepare and deliver an illustrated talk

Let's Explore

Prepare an illustrated talk on a topic related to horticulture. The idea box will help you start brainstorming possible topics. Then use the decision table on the next page to help you develop one or more visual aids that will support your presentation. Deliver the talk to your group and ask your helper to critique your performance.

Illustrated Talk Ideas

- Information from a seed packet
- How seeds germinate
- Traits of good flower arrangements
- Culinary uses for herbs
- Benefits of composting
- How landscaping improves appearance

Illustrated Speech Outline

Topic: _____

Introduction: _____

Main Points:

Conclusion:

Visuals to Use

Plan type of visual and where it will be used in the presentation.

Which Visual Aid Is Best?

Use:	When:
the real thing	• realism is needed to help the audience understand your point • the real thing is practical • the real thing is interesting enough to hold the viewer's attention
models/miniatures	• realism is needed but the real thing is not practical • inside views are needed
photos	• realism is needed but the object itself cannot be shown • you want to compare past and present, good and bad, etc. • you want to show something larger than life to make a point
posters/signs	• realism is not needed to make your point • you want to show organization or data (percentages, trends) • the information in written form helps the viewer understand and remember your presentation

Talking It Over

Share What You Learn

- How did you organize your presentation?
- How did you decide what visuals to use and how to use them?
- How do visuals affect oral presentations?

Use What You Learn

How can giving illustrated talks improve your presentation skills?

How will presentation skills be useful in the careers you are considering?

Take a Challenge

1. Help someone in your group prepare an illustrated talk.
2. Design a game in which horticulture presentation topics are matched with possible visual aids.

Video Gardening

You have probably had the experience of learning new information from television or videotape. Schools, training programs and businesses use instructional video to teach new things. One of the advantages of video communication is that instruction can be repeated again and again until the learner understands. This makes video an excellent tool for learning new horticulture skills.

Life Skill:

Communicating with others

Project Skill:

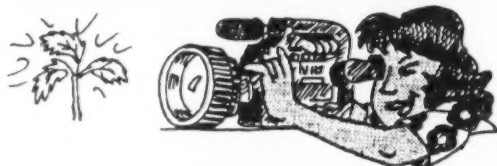
Division propagation

What to Do:

Design a video on perennial division

Let's Explore

With a friend, plan an instructional video on how to propagate perennials by the division method. Design the video for beginning gardeners. Use the story boards and content information to plan the footage you will need.



Draw what will be seen and write what will be said in each shot. If you have access to a video camera, film your program and share it with your group or family.

Dividing Perennials

Background

Dividing perennials means breaking a plant into sections that have enough roots and stems to survive and grow on their own.

Perennials tolerate division propagation differently. Plants such as coreopsis, achillea and chrysanthemum have a mat of slender, shallow roots that makes them easy to divide. Plants like lythrum, baptisia and phlox have deeper roots which makes division harder if the plants are older. Plants that have a crowded or single crown are best left alone.

Spring is the best time to divide most perennials. This gives plants a chance to recover from the shock of division in moist soils and cool temperatures.

Plants are usually divided into thirds or quarters, but the actual number of divisions will depend on the size of the plant.

Steps

1. Spade a circle around the plant at least 4 to 6 inches from the stem.
2. Loosen the soil deeply so you can lift the entire plant without pulling on it.
3. After the plant is out of the ground, look for natural divisions. Each cluster can be a new plant, provided it has at least one stem and a mass of roots.
4. If the plant has thin, shallow roots, pull the divisions apart by hand. For plants with tougher roots, use a sharp knife or shears to separate the division from the mother plant.
5. Transplant the new divisions just like a container-grown plant. First, prune away dead or damaged stems and roots. Dig a hole wide enough to spread the roots of the new plant. Set the division in the hole at the same depth it was previously growing. Put soil back around the roots. Make the soil firm and water it well.

Shot #1

Shot #2

Audio: _____

Audio: _____

Shot #3

Shot #4

Audio: _____

Audio: _____

Talking It Over

Share What You Learn

- Why is division a good way to propagate?
 - Is division sexual or asexual propagation?
 - What were the challenges and successes in planning your instructional video?
- _____
- _____
- _____

Use What You Learn

How has video changed the way you learn?

What new technologies have potential as an effective learning tool?

Take a Challenge

1. Develop written instructions to support your instructional video.

Your Future

What do you see in your future? Is it a job after high school? Maybe it's college or your own business. Regardless of what path you decide to take, the decisions you make now are important to help you reach your goals. The classes you take, the groups you join and the technical skills

you learn are like pieces of a puzzle that all fit together to make your career dreams come true. Learning as much as you can about careers now will help you make informed decisions later. The activities in this section will show you some ways to explore the possibilities.

Plants into Profit

Some people make a career out of growing and selling horticulture products. The plants in the flower shop, the vegetables in the grocery store and the trees in a yard all came from someone's business. One way to explore a horticulture career is to market some of your products. In this activity, you will develop and implement a plan to turn your horticulture products into profits.

Life Skill:

Planning your life

Project Skill:

Exploring horticulture careers

What to Do:

Develop a marketing plan to sell horticulture products

Let's Explore

First, complete the horticulture marketing plan. Identify advantages and disadvantages of the marketing method you chose.

Once your plan is finalized, take steps to implement it. Your helper and local Extension agent can help you.

Horticulture Marketing Plan

Product to Market:

Where I will sell products:

Year:

Demand for my product:

Advertising methods:

Competitors:

Regulations to check:

Selling prices:

How I will sell my product:
Farmer's market, grocery store, U-pick

Marketing Season (dates)

Advantages:

Disadvantages:

Talking It Over

Share What You Learn

- What did you learn about marketing your products?
 - What were some of the options you identified for selling your product?
 - What regulations, if any, did you encounter?
- How did having a plan affect your marketing?

Take a Challenge

1. Visit a farmer's market, roadside stand or U-pick to learn how these businesses are operated.
2. Develop an advertising plan for the products you sell.

Use What You Learn

Why is honesty important in displaying and selling your products?

In what situations have you had trouble being honest?

Exploring Careers

If you like working with plants, a career in horticulture might be for you. It is a huge field with all kinds of possibilities. Florists, landscapers, golf-course superintendents, vegetable producers, plant biologists and garden center managers are but a few of the possible jobs in the horticulture field. This activity will help you plan for your future as you explore the many careers in horticulture.

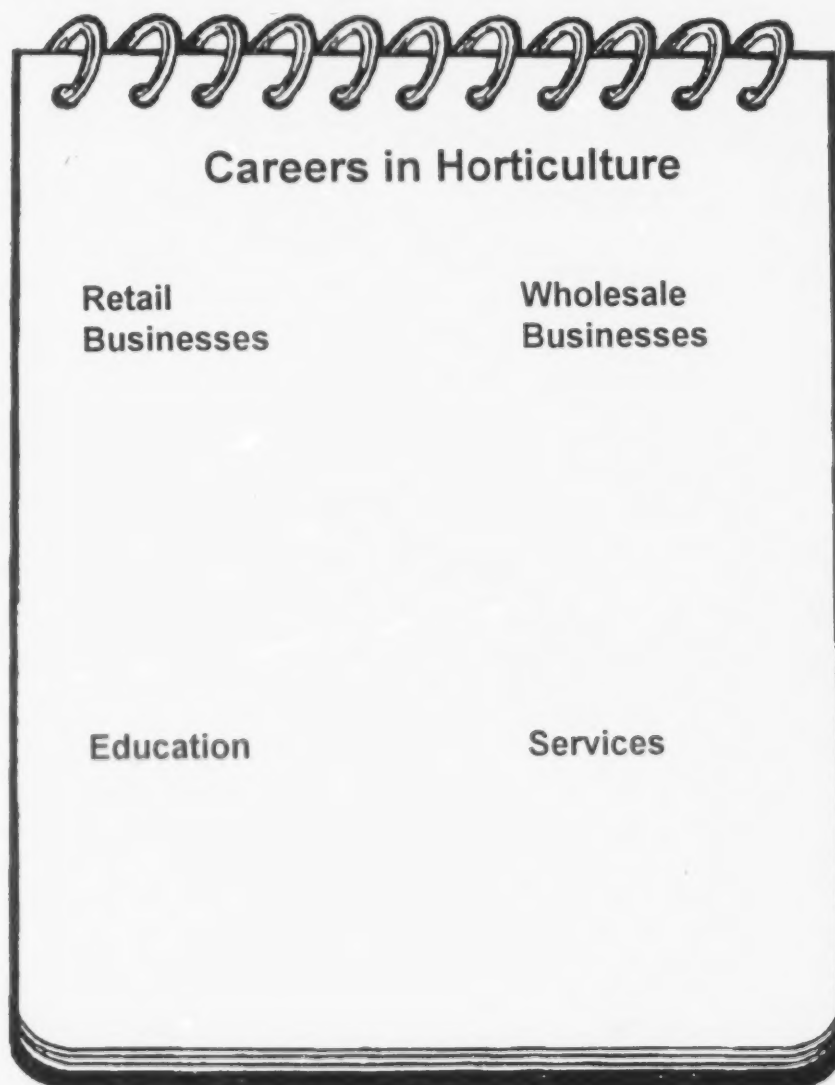
Life Skill:
Planning your life

Project Skill:
Exploring horticulture careers

What to Do:
Interview people in the horticulture field

Let's Explore

See how many different horticulture careers you can list in these four major categories. Interview people who work in the jobs that interest you. Find out what they do, how much training or education is required, and what the income might be. You can use the *Horticulture Career Chart* on the next page or make a more detailed interview plan to help you get the facts you need.



Careers in Horticulture

Retail Businesses	Wholesale Businesses
Education	Services

Horticulture Career Chart				
Job	What They Do	Training Needed	Where Trained	Expected Income

Talking It Over

Share What You Learn

- What did you learn from your interviews?
- Which of the careers interest you most?

What skills or personal traits do you need in order to pursue your career?

Use What You Learn

Why is it important to learn about careers before decisions have to be made?

What can you do now to improve your chances of having a successful career?

Take a Challenge

1. Make a plan for your own horticulture business. Include what products or services your business will sell, who your customers will be, facilities and equipment needed, and expected income and expenses.

Try It On

There are lots of different ways to pursue a career that interests you. Further education, on-the-job training and apprenticeship programs are only a few of the possibilities. The trick is to match what you like to do with a job you'll love. One way to *try on* a career is by spending some time with a person in that job as an intern. In this activity, you will get a close-up look at a horticulture career by completing a mini-internship.

Life Skill:
Planning your life

Project Skill:
Exploring horticulture careers

What to Do:
Plan and complete a mini-internship

Let's Explore

From the careers you explored in the last activity, identify a job you would like to learn more about. Contact someone in that job and explain that you would like to learn more about the field by spending a few days with them. Use the *Making the Contact* outline to organize your planning information. Then make a list of questions you want to ask while you are at the job site. Advance preparation will help you get the most out of your intern experience. Summarize with words or pictures key information about your experience.

Questions to Ask

While you are doing your mini-internship, you will want to learn as much as possible about the job. Make a list of questions you want to ask while you are at the job site.

- What is your specific job title?
- What do you do in your daily work?
- How long have you been in this field?
- How do you like your work?
- What do you dislike about your job?

Other questions I want to ask:

Making the Contact

Career to explore:

Who to contact:

Phone number:

Dates for the internship:

Time:

Location:

Appropriate clothing:

Jobs/activities I will see:

Other important details:

Talking It Over

Share What You Learn

- What were the most important things you learned from your internship?

- Did any of the things you learned surprise you?

- Will you explore this job field further? Why or why not?

What did you gain from this experience that could not have been learned any other way?

Use What You Learn

Why is experiencing a job a better way to learn about careers than just reading about them?

How will the skills you gained from this activity help you explore other careers?

Internship Summary

Write or record with pictures the most important things you learned during your mini-internship. This information will be useful as you compare different career possibilities. The items below will get you started, but you will also want to add your own personal information.

- Things I liked about the job

- Things I would not like about the job

- Skills I would need for this job

- Education or training I would need

- Expected income

Take a Challenge

1. Gather information about horticulture degrees and certifications from community colleges and universities.

2. Apply for a part-time job that would help you explore a horticulture career.

Glossary

Adaptation: a special development in a plant which helps it to live in a particular kind of place or climate

Annual: a plant which grows, flowers, produces seeds and dies in a single season

Biennial: a plant which takes two years to complete its life cycle

Bulb: a flower bud wrapped in thick leaves that provide food until the plant can grow in the soil

Coldframe: a box without a bottom that is covered with a light-admitting lid; used for starting and growing plants

Compost: a mixture of decayed organic matter generally used as fertilizer

Division: a plant propagation method in which a plant is broken into sections that have enough roots and stems to survive and grow

Farmer's market: a public gathering place where fruit and vegetable growers bring their produce to sell to the public

Flat: a shallow box in which small plants are grown from seeds or cuttings

Florist: one who sells flowers and ornamental plants

Foliage: plant leaves

Forcing: making plants blossom or bear fruit out of season by growing them indoors

Frost line: the maximum depth at which the soil freezes in the winter; varies with location

Germination: the development of a new plant from a seed

Hedge: a fence or boundary formed by a dense row of shrubs or low trees

Herb: a plant or plant part valued for its medicinal, savory or aromatic qualities

Horticulture: The art and science of growing vegetables, fruits, flowers and ornamental shrubs and trees

Hotbed: a bed of soil enclosed in a glass, heated structure used for starting and growing seedlings

Insecticide: a material used to control insects

Integrated Pest Management: a unified approach to keeping pest populations below an acceptable level while avoiding adverse effects on humans, wildlife and the environment; involves mechanical, cultural, biological, botanical, and chemical controls

Landscape plan: a drawing of an outdoor site which includes physical structures, trees, and plants

Landscaping: the art of designing outdoor space for convenience, beauty and pleasure

Loam: a soil consisting of a mixture of clay, silt, and sand

Nursery: a place where shrubs, trees and small vegetable and flower plants are grown

Orchard: a place where fruit and nut trees are grown

Peat moss: partly decomposed plant life, added to the soil in a dried form to hold water and supply organic matter

Perennial: a plant which lives for more than two years, as in the case of trees and shrubs

Private area: a landscaping term referring to the space that people use for outdoor activities; usually located to the rear of a house or building

Propagation: growing a new plant from a plant part such as a root, leaf, or stem

Public area: a landscaping term referring to the space located between a road or street and a house or building

Service area: a landscaping term referring to the space where work-related items, such as garbage cans, utility structures, clotheslines, and storage buildings, are located

Site analysis: a drawn picture of a piece of property which includes all structures and plantings on the property

Thinning: the removal of young plants from a row of plants

Transplanting: to move a plant from one place to another

Tropism: the response of a plant to a change in the environment

Turf: the upper layer of soil bound by grass and plant roots into a thick mat

U-pick: a commercial fruit or vegetable operation in which customers pick their own produce from the plants

Variety: a group of individual plants within a plant species with only slight differences

Resources

Armitage, Allan. (1993). *Perennials*. New York: Prentice Hall.

Belcher, Betty. (1993). *Creative Flower Arranging*. Timber Press.

Miller, Marie. (1981). *New Dimensions in Floral Design*.

Ortho Gardening Series. San Francisco, CA: Chevron Chemical Co., Consumer Products Division.

Rodale's Illustrated Encyclopedia of Herbs. (1987). Emmaus, PA: Rodale Press.

Sunset Gardening Series. Menlo Park, CA: Lane Publishing Co.

Urban Pest Control Handbook. Urbana, IL: Cooperative Extension Service, University of Illinois.

Voigt, C. E., and J. S. Vandemark. (1995). *Vegetable Gardening in the Midwest*. Urbana, IL: Cooperative Extension Service Circular 1331, University of Illinois.

Internet Sites:

Garden Gate
<http://www.prairienet.org/ag/garden/homepage.htm>

Michigan State University
<http://www.msue.msu.edu>

Ohio State University
<http://www.hortwww-2.ag.ohio-state.edu>

New York Botanic Garden
<http://www.pathfinder.com/vg/Gardens/NYBG/index.html>

University of Illinois Horticulture Classes
<http://classes.aces.uiuc.edu/Hort100/>

Check These Out

National Junior
Horticulture Association
1424 N. Eighth St.
Durant, OK 74701

National Gardening Association
180 Flynn Avenue
Burlington, VT 05401

Exhibiting Tips

Here are general guidelines for exhibiting a horticulture project. **Check your local 4-H show book for specific exhibit requirements.**

Herbs

Select herbs that are free of blemishes, bruises, and insect and disease damage.

Fresh cut: 12 stems or branches tied into 1 bunch with stem measuring 1 inch in diameter

Potted: 1 plant per container, or a combination of 2 or more plants

Annual Flowers

Check your 4-H show book to find out about the number of stems and kind of container to use for different kinds of flowers.

Select and cut flowers in the late afternoon or early evening before the show. If cutting flowers late in the day is not possible, you can cut them the morning of the show. Cut the stems longer than needed. Remove any leaves halfway up the stem. Immediately place the stems in a container of warm water.

House Plants

Exhibit a plant in the container in which it has been growing. Plant should be free of bruises, torn leaves, and insect and disease damage.



Vegetables

Check your show book to find out how many vegetables to exhibit and how to display them (on paper plates, in a container, etc.)

When exhibiting more than 1 specimen, select vegetables that are similar in size, shape, color, and stage of maturity. Choose vegetables that are free of dirt, cuts, bruises, defects, and insect damage. Make sure they are high quality and true to the variety.

One specimen: broccoli (head); cabbage; cauliflower; Chinese cabbage (head); eggplant; greens (collard, endive, kale, escarole, mustard, Swiss chard)—1 plant; winter squash; pumpkin; watermelon; horseradish—root; lettuce—one head or plant; muskmelon

Five specimens: asparagus spears; beets; carrots; sweet corn; pickling cucumber; slicing cucumber; kohlrabi; leek; large dry onions; parsnips; large peppers; popcorn ears; Irish red potatoes; Irish white potatoes; sweet potatoes; rhubarb stalks; turnips; summer squash; slicing tomatoes

Twelve specimens: green beans (pods); lima beans (pods); wax beans (pods); okra; green onions; set onions; peas (pods); small fruit peppers (chili, cherry, etc.); shallots; small fruit tomatoes

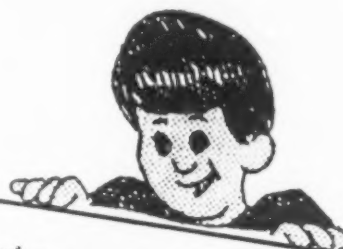


College of Agricultural, Consumer and Environmental Sciences

University of Illinois at Urbana-Champaign

Copyright 1996 by University of Illinois Board of Trustees

Authors and publishers have granted permission for copies of this work or parts of this work to be reproduced, provided that (1) copies are distributed at or below the cost of reproduction; (2) the author, the publication, and the University of Illinois College of Agricultural, Consumer and Environmental Sciences and the relevant division within the College are identified; and (3) proper notice of copyright is affixed to each copy.



Acknowledgements

Curriculum Coordinator:
Ann Rund

Extension Specialist, Youth Development
Content Specialist:
Jim Schmidt

Extension Specialist, Horticulture
Writer/Designer:
Annette Campbell

Extension Educator, Communications
Editor:
Phyllis Picklesimer

Artist:
Jerry Barrett



4-H Publication MJ0610

September 1996



Cooperative Extension Service
University of Illinois at Urbana-Champaign

In furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, D.R. Campion, Interim Director, Cooperative Extension Service, University of Illinois at Urbana-Champaign. The Illinois Cooperative Extension Service provides equal opportunities in programs and employment.